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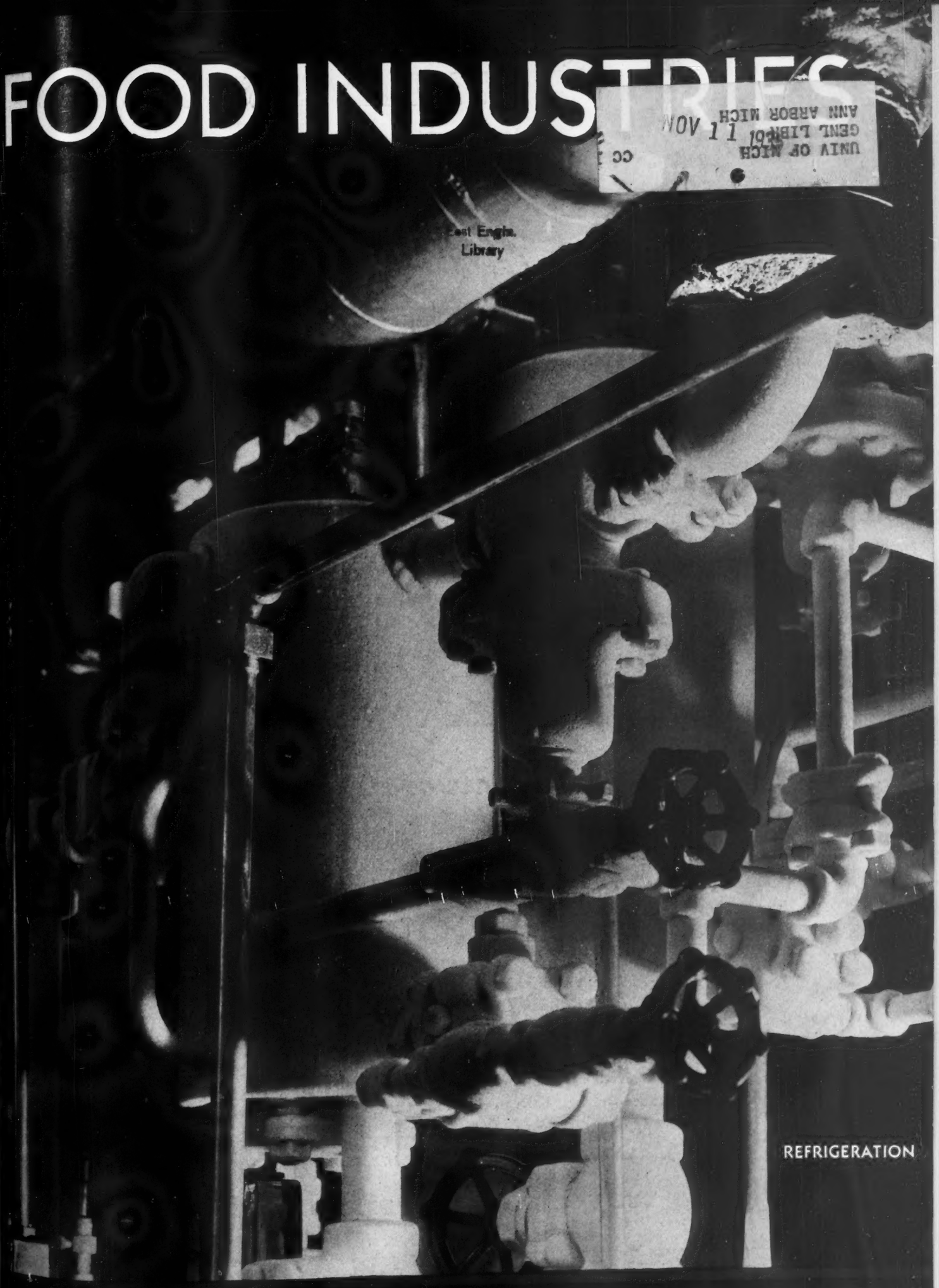

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NOVEMBER, 1935

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FOOD INDUSTRIES

PRODUCTION • ENGINEERING • DISTRIBUTION

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Established 1928—McGraw-Hill Publishing Company, Inc.

Vol. 7, No. 11

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Laurence V. Burton, Editor

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NOVEMBER 1935

THE TALK OF THE INDUSTRY

POLITICAL NOTE: "Down" in Maine last month visiting corn shops—the local designation for corn canning plants—we discovered a marked eagerness to discuss politics, by not merely the food manufacturers, but everyone.

When queried about what would happen in 1936 most Downeasters prefaced their remarks: "You know the old saying 'as Maine goes—'? Well, Maine is going 2 to 1 against the New Deal."

And over in northern New Hampshire the local comment was that 1936 would see a split on the basis of tax payers vs. non-tax payers.

OUR otherwise serene feelings have been greatly distressed to learn that federal warrants have been issued in Chicago for the arrest of certain members of the sales personnel of corn products manufacturers, of brewers, of sugar brokers, of syrup manufacturers, of can manufacturers as well as the executives of several baking companies. All because these gentlemen have been accused of selling their products to those unregenerate persons who are alleged to make alcohol without paying the excise tax.

Evidently all sellers of soluble carbohydrates, yeast and tin cans should have some sort of a clearing house where they can make each purchaser disinfect his career before orders are filled.

THERE is no telling where food processing may lead one—or at least there is no telling where it may be applied next. Castor oil, it seems, can now be made so palatable that it is a real pleasure to partake of this substance heretofore regarded as anything but a delicacy.

When an enthusiastic gentleman popped into these offices a few days ago and proffered us a generous sample, it was all we could do to resist

the impulse to consume it all. But this new ultra-refined castor oil, though produced by a well known vegetable oil refiner, is to be marketed as an "ethical product." Which means that it can be obtained only on prescription—worse luck!

WHAT could be more disconsolate news than the latest coming from Washington, N. J., where the strike against Consumers Research, Inc., has been going on for several weeks? Deputy sheriffs and constables originally hired to protect Consumers Research property have been laid off and have joined the picket lines of the strikers. Freeholders, as they are called in New Jersey, and local authorities are said to have refused to authorize the expenditure of further money for either deputy sheriffs or deputy constables. Now the strikers' ranks are augmented by these new unemployed.

Next comes the news that the strikers are stoning the plants and breaking windows, likewise throwing rocks at cars parked outside of the plant. Even the home of Mrs. Sally Phillips, Dr. F. J. Schlink's mother-in-law, has suffered the breaking of all its windows. Dr. Schlink's wife, be it remembered, is M. C. Phillips, the author of "Skin Deep."

Presumably, however, the advance royalties on Dr. Schlink's new book "Eat, Drink and Be Wary," which is to appear in November, will pay for the broken windows with money left over. Its publishers state that 16,000 advance copies have been sold and the book is in its third printing, even before its appearance.

TO a gentleman in Rochester, N. Y.:

You arouse our curiosity. Ordinarily anonymous letters go to the waste basket. But you say you like AAA. Do you mean the law or the administration? Are you paying processing taxes, or do you own a farm and receive benefits?

With the general objective of the Agricultural Adjustment Act we have no quarrel, but with the method of

attaining that objective we violently disagree. For years we have held to the principle that, until agricultural production is brought into some *natural* balance with market consumption, there will always be agricultural distress with secondary reactions in the industrial world.

Of course, if you express a par-

tiality for the agricultural adjustment administration, we can but agree to disagree.

Suppose that it were your personal task to keep a certain door closed against a heavy gale. Now most practical folk would fasten it with a bar, a bolt, a nail, a lock, or even a chair. But conceivably one could turn a hose against it; and, if the force of the stream of water were great enough, the door could be held shut, even against a tornado, as long as the water lasted.

Effective though a stream of water might be in this service, there is nothing even remotely savoring of permanence about it. The cost, of course, would be prohibitive. Furthermore, at the very moment the water supply should give out, the door would pop open again. What good, other than a temporary respite, would be gained?

To our way of thinking, the AAA (Act) will have no more enduring value to our national economy than the foregoing stream of water. As a method of raising enough money to pay farmers to practice self control, processing taxes are beginning to fail. Collections are less than they were a year ago. Hundreds of millions of dollars are being spent in vain. An opportunity to effect a permanent solution of the surplus agricultural land problem will have been wasted.

Can you agree with us that, as long as it is necessary to pay the farmers to practice self control, it is a good thing to have a pretty steady source of funds from which payments are to be made?

Can you view with complacency the fact that monthly processing tax collections have been declining from $43,000,000 in July, 1934, to $30,000,000 in June, 1935, and to $15,000,000 in July, 1935—assuming that you believe in AAA.

Does it not look to you as though something were going to go wrong with the whole scheme of financing payments for "adjustments"? Of course we admit that court injunctions have something to do with the reduced revenue, but so have a lot of other things including the inability of processers to earn the amount demanded by the tax. Not every processer is able to pass the tax along. There is no way to compel people to buy.

After all, is it a matter of serious importance to the man failing in his attempt to hold the door closed by means of a stream of water, whether the well went dry, the pump broke down, the steam was shut off, the pump lost its prime, or the hose burst?

If FOOD INDUSTRIES is anti-New Deal, it is because we are pro-common sense.

That F.T.C. Inquiry

GLEE and disappointment have both greeted the delay in the Federal Trade Commission inquiry as to the spread in food prices between farm cost and market-basket price. Those who are gleeful at the failure of Congress immediately to provide money for this inquiry think that the industry has escaped from a threatened Inquisition; but those who are more realistic or more conservative realize that the delay is not by any means all gain. Perhaps, in fact, it is a net loss to the food processor.

Whether we like it or not, we must recognize the pent-up feeling of public criticism against higher food prices. Such criticism always follows a price rise which directly affects the housewives' spending at the grocery. There is nothing to be surprised at except the fact that politicians have so largely neglected to capitalize this for themselves.

The Federal Trade Commission is a fact-finding body. Few of us like all the things it does or all the conclusions it reaches. But well-informed observers believe that the investigations of FTC are essentially fair and honest.

Among the subjects to be studied, and on which unwarranted charges may be disproved, are several of fundamental importance. Particularly we anticipate that politicians will lose any real foundation for claims that food markets are rigged, that excessive profits are made, that spreads and margins are socially improper. It is to be hoped that a vast majority of the divisions of the food business, when they are studied, will afford clear refutation of such charges which have become all too common in political halls.

In the food inquiry there will be some bias, as in all. But the conserv-

Hors d'Oeuvres

• Canned lion meat sold to those who would be brave is said to have enriched a foxy Frenchman to the extent of twenty-five grand annually until the gendarmes caught up with him. Well, in this country a good business is done in canned rattlesnake meat, but we hope it's no reflection on American character.

• *Under the terms of a recently enacted Wisconsin bill, school children will be taught the food and health values of dairy products for at least fifteen minutes each week. That state certainly believes in "Badgering" people into eating more of its products.*

• During the late eighties, American wines were competing successfully in European markets, and wines from California, New York and Florida won the highest award in the great Paris Exposition of 1900. Now we know what they mean by "the good old days."

• *A Jack Dempsey milk chocolate bar has been introduced in Buffalo by Loft. It would seem that a chocolate bar would be more appropriately named after the Brown Bomber, and if any food company is bringing out anything flat like a pancake, it might be called the Max Baer.*

• Beer is beginning to look like the national savior. In addition to reviving a dead industry and paying millions into the treasury, the amber fluid will boost the struggling steel industry with a 1936 order of 1,500,000,000 cans requiring 3,000,000 base boxes of tin plate.

• *Premature publicity recently led to the belief that wine would emulate beer and immediately go in for tin cans in a big way. But Wine Institute tells us that only one concern actually has done anything with wine in tins, and its product will not be out before next year. Well, it made a good story.*

• A new use for macaroni: Two pieces stuck in the top of a fruit pie keep the juice from bubbling out and overflowing, so says a "household hint" of Standard Brands, Inc. Maybe macaroni sticks also would make good bean shooters, bubble blowers, beverage straws, cigarette holders and what have you.

ative members of the food processing groups which have not made themselves vulnerable by the sort of "purple" past now popular with the S.E.C. have nothing to fear from such a study.

The food industries are in for a searching inquiry and the sooner it starts the better it will be. The commission will do a thorough job. Those who are afraid of the results should not fight against having the job done, because that is futile; they would do well to get busy to put their own house in order that they may escape criticism.

And it is to be hoped that the investigation will reveal the facts that will put a stop to the silly mouthings of the AAA spokesmen, such as Secretary Wallace's recent ill-considered outburst against the much needed increases in bread prices.

Potato Control

SECRETARY WALLACE shows a conservative side of his nature by objecting to enforcing the new potato control law as it is now written. Although each of us may privately think it is a fool law, it is certain to be most beneficial to the food manufacturing industries. At the moment, we cannot recall any branch of the industry that would not be benefited by higher prices for potatoes, except the potato starch industry, of which it is said there are only two plants, both located in Maine.

How Many Lives?

WE HAVE always thought that it was the cat that had nine lives. Now we learn that it is the Blue Eagle. NRA, and all its old implications, is again to be attempted in Washington. Probably the buzzard label will not be used; but the labor phases of the Johnsonian regime in NIRA administration are again being undertaken.

Major George L. Berry, former A.F. of L. executive of the highest type, heads the new movement. He staggers under the title "Coordinator for Industrial Cooperation." But the real job, according to the latest Presidential plan, is that codes submitted through Federal Trade Commission procedure shall again contain labor limitations. And these will be subject to investigation and review by Berry's NRA organization, freshly treated by the pulmotor to permit functioning again as an agency of code making.

Perhaps there are a few food industries which really want codes badly enough to start on the rocky road now charted in this new plan; but we doubt it. And even though they start, we still more strongly doubt whether they will ever reach their destination.

But, with respect to trade practice agreements, we are not so skeptical. There is a real opportunity for service in them. They remain, under the latest Presidential program, purely voluntary. An industry wanting to proscribe certain bad practices may do this under the Federal Trade Commission procedure which was established more than a decade ago, and which gives promise of functioning fairly well.

To undertake the fixing of such trade practice regulations as are enforcible under the FTC law, it is *not* required that labor provisions be added. This is fortunate for the industries interested. Incidentally, it is in accordance with the law. Perhaps that is why even the latest incarnation of the Blue Eagle is not permitted to perch in every code conference meeting room.

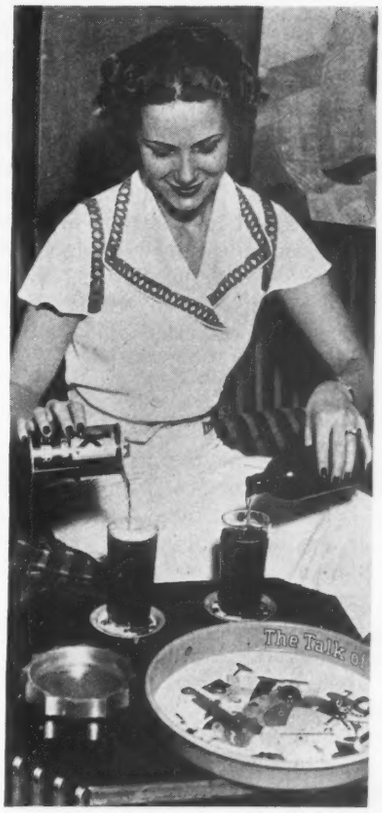
"Profiteer"

WATCH for the early reappearance of the word "Profiteer," is the latest advice from Washington. Public indignation since the beginning of the depression has been aimed successively at the speculators who sold short; at the bankers who refused to lend; at holding companies that were beyond regulation; and at chiselers who stood in the way of higher wages and shorter hours. Less is going to be heard of these alleged abuses, but soon the air will be filled with complaints about the cost of living and the conscienceless profiteers.

Higher Taxes

DESPITE the President's implied promises, taxes will be higher. But this does not mean that the President, especially in an election year, would not like to make them lower. He surely would. But it is very likely, in fact almost certain, that taxes must continue to climb.

The revised federal budget announced last month, forecasts a lower deficit this fiscal year than was forecast in what, even now, appears to have been a deliberate effort to make things look as black as possible. That effort seems to have been to persuade Congress to be willing to grant huge relief appropriations. The revision, therefore, is nothing more than a re-



HAMILTON WRIGHT

BEAUTY AND THE BEERS
Fighting for the favor of the brewers, can manufacturers and bottle makers are competing for millions in future business. Representative of the battle are the Kreuger can and the Piel no-return bottle held in the hands of pretty Betty Douglas (address unknown). Elbows bent twenty-three billion times last year to pour as many beers down the hatch, and present estimates have it that next year one and a half billion will be poured out of cans.

version to facts: facts that reasonably could have been much more accurately forecast last January when the deficit of $4.5 billion was predicted. Hence the present estimate of $3.5 billions for a deficit gives very small comfort.

And worst of all, even the revised figures neglect two important considerations. Immediate cash payment of the veterans' bonus is expected to be authorized early in the next session of Congress. That will cost from $1.2 billion to $2.2 billion, according to the extent of compromise that may be achieved in the interest of "economy."

And there is the equally important question of processing taxes. It is widely expected that these will, in some measure, be declared unconstitutional by the Supreme Court. Food manufacturers naturally hope for that decision. But if there is any curtailment of this tax income, there

will be a corresponding new burden on the treasury. If all the processing taxes are eliminated, the burden will be increased $0.6 billion per year.

Anyway we figure it, we see larger federal burdens, not smaller. We are constrained to believe that pre-election reasoning, not new fiscal policy, occasioned the new budget calculations. Food processors, therefore, had better keep on setting aside generous tax reserves out of profits, if any.

How to Prepare for Inflation

THE time to put one's affairs in order to meet a possible inflation is before that time comes. Sales contracts, granting prices or credits to buyers for long periods, such as a year or more, are not common in the food industries, but are particularly vulnerable in the event of inflation becoming a reality. Some business houses today are limiting such contracts to three months, and where firm contracts are made they are inserting a clause permitting cancellation on 30 days' notice.

To many an executive this will seem like an unwarranted precaution and, indeed, the failure of the Federal Government to get its $4,880,000,000 spending program under way is a favorable sign. Nevertheless a grossly unbalanced budget cannot go on forever without creating alarm some time.

Thirty-Hour Bill

THE 30-hour bill will be the subject of valiant legislative effort during the next session of Congress. The backing will be better organized than heretofore, and there is a real chance that the bill may be enacted. Considerations which affect any pre-election session of Congress, of course, are most important in this fight.

Arguments will do no good. The only influence which the food manufacturer can have in this battle is by expressing himself forcefully and clearly against so silly a bit of legislation while his Congressman is at home during November and December. Political considerations will determine the character of ballots on this issue. Nothing else really counts. Action is clearly necessary by opponents just as much as by advocates.

No Light Wasted

ON equipment of German make, we have recently seen a switch that many a factory superintendent would appreciate having on certain of his lighting circuits, especially in stockrooms and dark warehouses where only temporary illumination is needed. This switch is of the push-button variety and holds the lights on about three minutes and then turns them off. The release mechanism is a small rubber diaphragm in which there is a tiny hole. Pushing the button expels the air quickly and the pressure of the atmosphere holds the contact in place until enough air leaks in through the hole to permit the diaphragm to resume its previous position, thereby breaking the circuit.

The device is simple, rugged and apparently cheap, but we have no idea where it can be obtained, except that it seems to have come from Germany.

Oil in the Bottle Washer

IT IS one of our fundamental concepts of the perversity of human nature that if anyone imagines a queer stunt somebody else will be found actually doing it. And from the carbonated beverage industry comes a substantiating example.

A bottle washer had been turning out bottles covered with a film instead of a brilliant clear surface. A Ph.D. chemist, Max Levine, was turned loose on the job and found that someone had piped the exhaust from a steam pump into the alkaline soaking solution to conserve the heat in the exhaust steam. Cylinder oil, carried in exhaust steam, will not saponify in lye. Hence the film.

The economy would have been all right if the plant engineer had handled it so that the oil could not have gotten into the lye. Traps, strainers and steam separators, or a coil heater would have done the trick.

What to Invent

PROBABLY it is something of a shock when men trained in scientific research are made aware that they have been trained in inventing. Probably it also comes as a surprise when an employer discovers that in hiring a research man he is engaging the services of a certain kind of inventor.

By keeping that thought before them, both parties are now ready to consider the next thought: What to invent, or what needs inventing, is more important, economically speaking, than the process of inventing.

Employers are making an error in expecting a man new to the business to know what to invent. It is management's obligation to supply the research man with the problem that, if

WIDE WORLD

FARMERS AGAIN SPILL MILK

Some of the farmers in the Chicago milk shed decided that $1.75 a hundred was too little for their milk—that they ought to have $2.50. The milk companies couldn't see it that way, so the producers went on strike Oct. 1. Their second day's activities included dumping 30,000 gal. of milk from tank cars. On subsequent days many non-conformists were stopped on the highways by pickets who emptied their milk cans and sometimes beat them up for good measure. The strike caused no serious shortage but was estimated to have cut the normal supply by 23 per cent.

ACME

DAIRIES HELP CUT CITY DIN

Milk distributors in New York City are making capital of Mayor LaGuardia's anti-noise campaign. They staged a show at City Hall which contrasted the quiet pneumatic-tired tank truck with the old, rumbling, solid-tired box truck which carries cans. Pneumatic-tired milk wagons and silent-shod horses also were on hand. Incidentally, one company's announcement that it would put 2,000 of the new silent horse-drawn units on the streets got it reams of free publicity.

solved, is of economic benefit to the business.

Cleanliness Is Economy

SCRUPULOUS care in cleaning processing equipment is always desirable. But when the food material is a fruit and the equipment is fabricated from some of the corrosion resistant alloys, the need for perfect cleaning is imperative.

Too often the cleaning consists only of flushing out with cold and hot water, a procedure that sometimes leaves particles of food stuck to the equipment in inaccessible places. Under such conditions, if the equipment is idle for some time, the polished surface may become pitted underneath the particles and further corrosion may be accelerated. In extreme cases the corrosion has penetrated clear through the metal.

Costly equipment can be ruined by slovenly cleaning. It is economy to be thorough.

Who Shall Judge?

TO DECIDE who shall be the judges of quality is a feature of a development program of importance equal to any other part. All too often this phase of an experiment is left to haphazard selection.

It is vastly more difficult to obtain honest, as well as competent, criticism of quality than it is to find an honest man. People who would rather lose a right hand than take a dishonest dollar are frequently guilty of the grossest sort of well-meant deception when one asks their opinion of a product. Fear of injuring someone's feelings, or unwillingness to speak adversely of something the boss likes, is usually at the bottom of reluctance to speak the devastating whole truth.

Then, too, opinions vary at different times. It is an old trick—so old that one is ashamed to even mention it—to get a favorable opinion by asking the judges to taste samples just before noon when all are hungry. There is no denying it: hunger is a splendid appetizer. But to get a favorable reaction after a satisfying lunch—Ah, there is a real test!

We ourselves cannot pose as authorities on the proper methods of testing and tasting, although we confess a fairly wide experience at it. About the best we can derive from experience is a set of principles, the most important of which is to beware of a single opinion. Even beware of only two, three or four opinions.

Also beware of an executive who has an exalted idea of his own sense of taste unless long experience in trial and error has justified it. There is no surer way to put out a product of limited appeal than to depend only on the flavor preferences of the head of the works. The man who is a "good liver" does not necessarily know the public's tastes.

Important also to keep in mind is the fact that many people differ markedly in their ability to distinguish flavors. The threshold value, by which is meant the minimum distinguishable amount, particularly of sweetness, is decidedly different in different persons.

In early experiments the opinions of a few persons may be helpful, but as the time approaches to decide on what appeals to the mass of consumers, it is important that the tasting be done by a jury that adequately represents the public's mass appetite.

If possible, one should get a vote from a group of representative housewives who are among the prospective customers. One candy manufacturer about two years ago spent three months getting a prospective consumer vote on the selection of confections to be manufactured and packed as a high quality box of candy. The judges were selected on the basis of three age groups, for both men and women, and on the basis of occupation, and of urban or rural residence. Strictly office workers are usually very unreliable judges.

Problems of Re-Use Containers

IN RECENT months a new angle on the re-use value of containers has become apparent. It is tied up with the problem of the returnable container, particularly those where a cash deposit is required to insure their return.

Consumer advertising has convinced the public that the container has a definite cost and occasionally a secondary value to the buyer beyond its primary function of product protection. This build-up has reached such proportions that many a housewife cannot bring herself to send a re-use container to the junk-pile even when she has more on hand than she knows what to do with.

Cases have recently arisen where housewives have appeared at retail stores with a basketful of re-use containers, demanding a refund of money for them. And when they were denied any return for their containers, they immediately developed some very human emotions.

Re-use containers as a merchandising adjunct most certainly do have a place in the scheme of things, but prudent management does not allow the idea to dominate its vision nor permit it to become a fixture.

Selecting a Refrigerating System

PART TWO

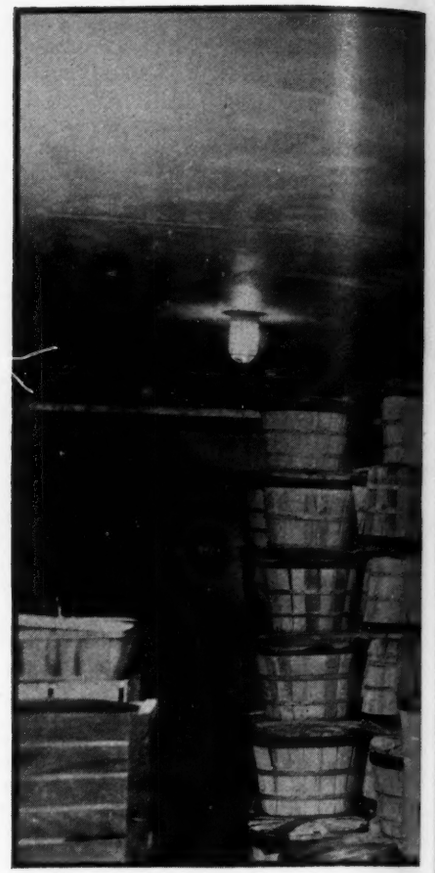
A discussion of the relative merits of brine, direct expansion and flooded ammonia systems in cold storage rooms

By L. A. RAMSEY
Engineering Division, York Ice Machinery Corporation, York, Pa.

IN PART ONE of this article (FOOD INDUSTRIES, October, 1935) no consideration was given to the refrigerating system for the freezer space in the large cold storage plant. If the plant has a total volume of approximately 150,000 to 1,000,000 cu.ft., an economical arrangement is to use brine circulation for the high temperature space and flooded ammonia coils for the freezer space. In this size of plant the ammonia coils in the freezer space are not too extensive and can be operated at the same ammonia suction pressure as the shell and tube brine cooler which cools the brine for the high temperature rooms. For instance, if the same temperatures and pressures are used as before we would have: 30 to 35 deg. F. high temperature rooms; 15 deg. F. brine circulating through the coils in these rooms; 5 deg. F. ammonia corresponding to 19.6 lb. suction pressure in the brine cooler and in the flooded ammonia coils of the freezer space. About the lowest freezer space temperature under the above conditions would be 15 deg. F. If it was necessary to have a colder freezer temperature, it would be economical and advisable to lower the suction pressure.

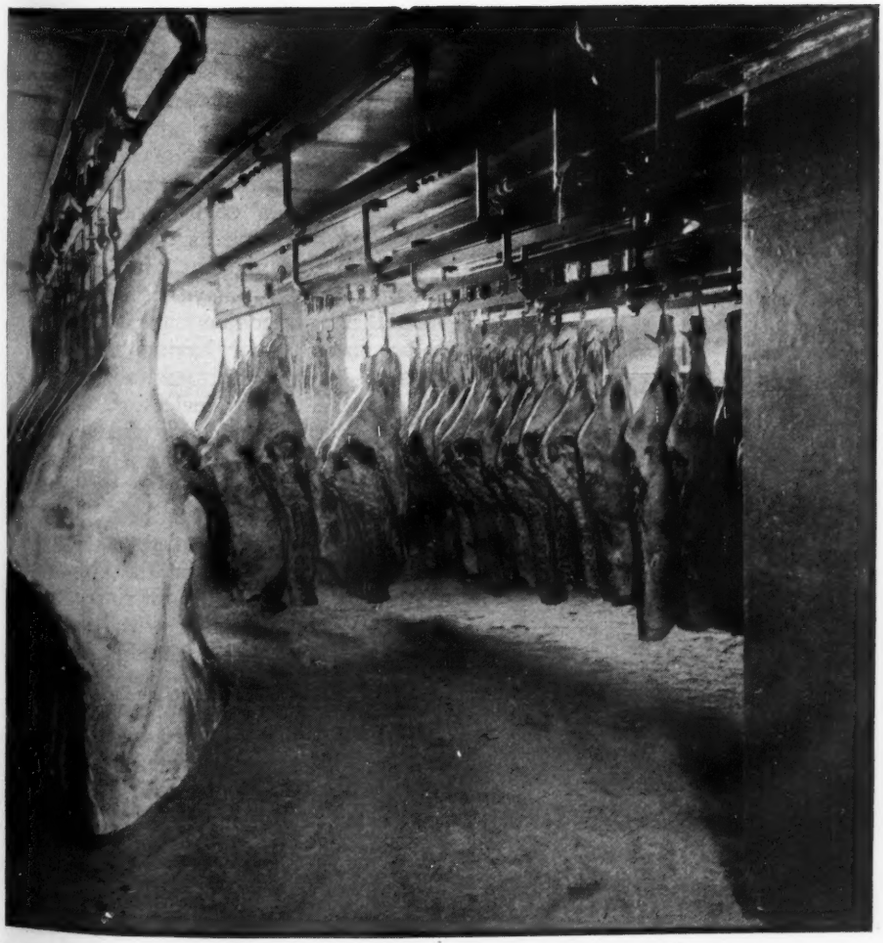
If this plant had considerable low temperature freezer space to be held at —10 to 0 deg. F., it would be advisable to install a booster compressor operating at about 0 lb. suction (corresponding to —28 deg. F. ammonia) and discharging into the low side of the other compressor at 19.6 lb. pressure. Considerable power is saved in this way, because a large percentage of the total refrigerating tonnage is accomplished at the 19.6 lb. suction pressure. The booster compressor as well as the main compressor preferably should be of the vertical-single-acting type and both should be arranged with capacity-reduction partial by-pass valves, which are necessary to give the plant proper flexibility. These valves reduce the capacity of the compressor while it is operating at a constant speed.

The vertical single-acting compressor is the most efficient of the various types, due to smaller clearance, less reheating of the gas in the cylinders, gas more readily filling the cylinders on the suction stroke, and the compressor working on the uniflow principle (the cold gas enters at the cool end of the cylinders and leaves at the hot end. In the horizontal double acting compressor the cold suction gas enters and the hot discharge gas leaves alternately at each end of the cylinder). Loss of ammonia from the stuffing box of a vertical enclosed compressor is practically avoided as the stuffing box is on a rotating shaft instead of a reciprocating piston rod, and is packed against suction pressure



Beef cooler, showing the overhead tracks and trolleys used for handling the beef into and out of storage.

Typical small cold storage room using direct-expansion, finned Freon coils and thermal expansion valve.



instead of discharge pressure. All bearings are self-oiling, thus reducing attendance to a minimum.

IN very large plants, having a large volume of freezer space, it is advisable to carry high and low temperature brine in two distinct systems. In this case, two sets of brine coolers are required, with two sets of pumps.

It might be expected in such a case that the following conditions would obtain: 30 to 35 deg. F. rooms; 15 deg. high temperature brine; 19.6 lb. ammonia suction pressure (5 deg. F); 0 deg. F. freezer room temperature; —14 deg. F. low temperature brine and 0 lb. ammonia suction pressure (—28 deg. F.). There would be a booster compressor taking the 0 lb. gas and compressing it to 19.6 lb., and the main compressor would work between 19.6 lb. suction and whatever the condensing pressure is, say, 165 lb. This is a bare outline of the general operating conditions and does not cover details of various types of gas and liquid coolers between the booster machine and the second stage compressor.

Summarizing, as a general rule, the recommended types of refrigerating systems for various sizes of cold storage would be as follows:

1. Small refrigerating plants such as chain stores, etc., use direct expansion Freon or ammonia coils, the Freon with thermal automatic expansion valves and ammonia with the flooded system.
2. Small cold storage rooms up to approximately 150,000 cu.ft. capacity, use all flooded direct expansion ammonia, the freezer space being on a separate compressor at a lower suction pressure.
3. Cold storages between approximately 150,000 and 1,000,000 cu.ft. total space use brine circulation for the high temperature rooms and flooded direct expansion ammonia for the freezer space. The brine cooler and the direct expansion flooded coils to operate on the same suction pressure.
4. Cold storages above approximately 1,000,000 cu.ft. of space use high temperature brine for the high temperature rooms and low temperature brine for the freezer rooms. Booster compressors to operate at approximately 0 to 3 lb. suction and discharge into the low pressure side of the high suction pressure system.

While the above recommendations are the results of averaging a large number of installations, there may be special conditions on a particular plant which would make it beneficial

to shift from one classification to another after a careful study by a competent engineer.

The refrigerating load on the coils in a cold storage room varies greatly, especially if the goods are held for long periods. The load is very heavy if a considerable volume of goods is put in the room at one time and it gradually reduces to the point where practically the only load is the heat leakage. In the larger plants a good arrangement is to have just enough coils in the rooms to take care of the minimum load and then have one or more central bunker cooling rooms with fans and ducts with dampers arranged so refrigerated air can be circulated through any room which is being filled. This keeps the temperature of such a room from rising, a condition which would be injurious to the goods already in the room. It also quickly removes the excess moisture from the goods and the air, depositing the same on the bunker coils as frost, where it can readily be removed when the bunker coils are not in use, and without affecting the cold storage room temperatures. The removal of the excess moisture precludes the possibility of the moisture collecting on the cold goods already in the room.

AN alternate arrangement is to have a unit air conditioner, with its own fan, in each room. In this case it would be operated only as long as required to bring the fresh load of goods down to the room temperature, when the room coils could handle the load.

In large plants which have considerable freezer space, some of which may have to be used as high temperature storage at times, the high and low temperature brine mains are usually arranged so that certain freezer rooms may have either type of brine circulated through their coils. The coils are also divided so that portions of them can be closed off if required, in order to carry the correct temperature in the rooms.

In large ice cream hardening rooms, long cream storage, or similar spaces, an ideal system is the liquid ammonia recirculating system. The room coils are arranged in banks overhead. By means of a motor-driven gear rotary pump, the liquid is circulated up to distributing headers from which it flows by gravity down through the room coils, thence to a suction trap where the liquid and gas are separated, the gas going to the compressor and the liquid being recirculated.

Some of the advantages of the liquid recirculating system are:

1. The evaporator surface is fully wetted under all load conditions because the pump handles several times the amount of liquid evaporated.
2. There is no internal resistance or congestion. The liquid flows down through the evaporator with suitable gas "take offs."
3. The evaporator is at a uniform temperature throughout. There is no static head of liquid regardless of the evaporator height which is very important on low temperature work requiring low suction pressure. Every square foot of surface is equally effective.
4. The compressor always operates at maximum efficiency because there is practically no pressure drop between the compressor and any part of the evaporator. The suction gas leaving the evaporator suction trap is practically at saturation temperature.
5. The evaporator has free drainage, so that no oil or aqua ammonia can collect in the coils to retard the heat transfer. The coils can be quickly drained of refrigerant for rapid defrosting by the hot gas method.

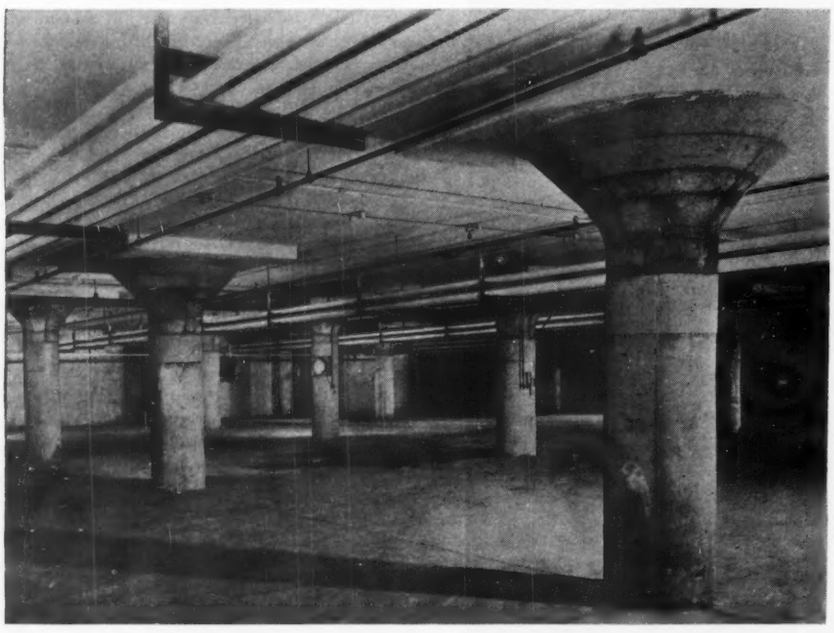
A PHASE of cold storage work that is often given too little consideration is the ventilation of cold storage rooms and the maintaining of the proper humidity. Excessive humidity promotes fungus and bacteria growth, rot and decay. Too low a humidity causes shrinkage by evaporation, loss of weight and shrivelling of the product. Fruits, vegetables and similar products require conditioned air to prolong their life. Vegetation during growth absorbs carbon dioxide gas and gives off oxygen. After maturity this condition is reversed and it takes up oxygen and gives off carbon dioxide gas which, being heavier than air, settles down around the product in the cold storage room. This phenomenon tends to destroy the vegetable life.

The best means of ventilating a cold storage room is a device that continually removes some air from a point near the ceiling and replaces it with fresh cooled air admitted near the floor.

Both the high and low temperature loads of a cold storage plant may vary as much as 300 per cent during various months of the year, so it is essential to have the necessary flexibility in machine capacity. This is accomplished by having compressors of different sizes and all having capacity reduction devices.

It is recommended, especially on large plants, that two brine coolers be used on each system, the total capacity of the coolers to be 150 per cent of the maximum tonnage requirement. This means that if one cooler has to be shut down for repairs, the other cooler will be able to handle the load by adding some machine capacity and lowering the suction pressure. There should always be a spare brine pump for each system. A spare compressor above the maximum requirements is very good insurance.

The value of the goods stored is so great and they are so perishable that it is best to be prepared for any emergency.



Typical large cold storage room, showing the brine circulating coils suspended from the ceiling down the center of each bay. Note the recording temperature controller attached to one of the columns.

Dust Disasters

*Consequences, Causes and Control of Dust Explosions**

By DAVID J. PRICE
Bureau of Chemistry and Soils
Washington, D. C.

THERE have been at least 385 dust explosions in the last nineteen years in connection with the handling, milling and processing of products largely agricultural in origin. Three hundred and eleven persons lost their lives in these explosions, 693 more were injured and property and stock losses amounted to more than $35,000,000—more than $90,000 for each explosion.

These disasters have occurred in practically all of the grain-handling operations, such as in grain elevators, flour and feed mills and starch factories, and in other food industries such as sugar refining, the preparation of powdered milk and the manufacture of coffee and spices.

The causes of these dust disasters are many. The sixteen major explosions occurring during 1934 are attributed to these sources: grinding and pulverizing operations, 5; fire fighting operations, 2; metallic sparks, 2; friction fires, 2; defective extension lamp, 1; backfire from boiler, 1; static electricity, 1; undetermined but attributed to electrical sources, 2.

Tests and practical experience have shown that it is possible to vent grain-dust explosions without structural damage. Engineers of the Bureau of Chemistry and Soils recommend not less than 1.25 sq.ft. of venting area for every 100 cu.ft. of space.

Several recent explosions have demonstrated the desirability of removing foreign material from grain. Investigations have indicated that dust clouds were ignited by sparks from metal particles in the grain. Screens of 1½ to 2-in. mesh, placed in the gratings over the receiving pits, have in many instances stopped large pieces of metal, and the use of such screens should be given consideration. The practical value of magnetic separators, too, ought to be given further attention, and methods should be developed for the removal of any metal that may drop into the grain while it is being handled.

The value of closed bins and the undesirability of interconnections between storage bins have been definitely established. Open bins and those with direct connections permit rapid propagation of the flame and extend the violence of the explosion.

THAT proper steps should be taken for adequate protection of electrical equipment and appliances has been amply demonstrated. Electric lamps should be protected with outer dustproof globes and heavy wire guards to prevent breakage. Portable spotlights of suitable design, to be directed into bins through manholes, should be used instead of extension lights as temporary or occasional lights for bin examination.

Static electricity has appeared as one of the prominent causes of dust explosions. Provisions should be made for removal of static charges on all types of mechanical equipment handling or operating in the presence of combustible dusts.

Reduction of oxygen content by introducing inert gas, such as carbon dioxide, in grinding and pulverizing operations has proved effective in the control and prevention of dust explosions. In grain grinding operations, when the oxygen content is reduced to approximately 12 per cent, complete protection is afforded.

Cleanliness and good housekeeping are matters of prime importance. Dust should be collected and removed without being permitted to accumulate in any section of the plant. Dust explosions cannot occur unless combustible dust is present.

A puzzling situation with reference to explosions in grain handling plants has been encountered recently. There seems to be a definite feeling on the part of operators of these plants that a number of recent disastrous dust explosions may have been associated with residues of explosive gases remaining in the grain after fumigation operations. Additional scientific knowledge on this problem is needed.

A number of explosions in industrial plants have occurred during fire-fighting operations. Such explosions may be caused by dust clouds which are stirred up and come in contact with the fire. This may happen when a stream of water strikes settled dust or when floors fall or the bottoms of storage bins drop as a result of burning. Explosions also have taken place when firemen attempted to remove the contents of bins and other enclosures to determine whether the original fire in the bin had been completely extinguished. As precautionary measures against these dangers, explosive dusts should be wet with a spray instead of a stream, and the contents of bins should be thoroughly drenched before removal. It is also advisable to have the plant systematically inspected by firemen that they may become familiar with the building.

NEW processes and new equipment may also involve dust explosion hazards. It is therefore extremely important that new manufacturing operations be carefully examined.

Since the government started keeping statistics in 1860, grain elevators have led the entire industrial field in number of dust explosions with flour mills second, feed and cereal mills third and starch and corn products plants fourth. There has been, however, a marked reduction in losses from explosions in the food industries during the last five-year period, 1930-34. In flour mills, the records show only five explosions for that period, and only two in starch and corn products plants. This fine record of progress in dust explosion prevention and control during the last five-year period is a challenge to continue this achievement.

*From papers read before National Safety Congress in Louisville, Ky., in October.

Not So Safe

Food plants lag in accident reduction. Injuries more frequent in last year. National Safety Council names honor roll

FOOD MANUFACTURERS have not made as great progress as other industrial concerns in reducing the number and seriousness of accidents. In the last eight years, the frequency rate for accidents in food plants has dropped but 40 per cent as compared to 57 per cent for all industries. As to severity, the record is even worse, the rate declining only 2 per cent as against 37 per cent for all.

During 1934, however, food plants bested the average by reducing the accident-severity rate by 4 per cent, while permitting a 5 per cent increase in the frequency rate. The record for other industries shows increases of 5 per cent in both rates. The food industry now ranks nineteenth in frequency and eleventh in severity among 30 major industries. Based upon reports from National Safety Council, these figures are taken for 342 food plants with employees working 245,547,000 man-hours during the year.

These reports show an average of 16.42 for the accident-frequency rate in food plants last year in comparison with 15.29 for all industries, and 1.18 for severity, against 1.70. The frequency rate is based upon the number of disabling injuries per million man-hours of work, while the severity figure is determined by the number of days lost as the result of disabling injuries per thousand man-hours of work.

Since 1926, progress has been made in eliminating permanent partial disabilities and temporary disabilities, these decreasing 39 and 40 per cent, respectively. But fatalities and permanent total disabilities have increased 43 per cent. As to the severity of permanent partial disabilities, there has been a drop of 41 per cent, while temporary disabilities have declined 25 per cent in severity.

Manufacturers of beverages had the highest 1934 frequency rates in the industry. They averaged 32.99. Distributors of dairy products had the highest severity, 2.05. Large increases in frequency, from 1933 to 1934, were registered by manufacturers of miscellaneous food products, by bakeries and by milling companies. The beverage, confectionery and dairy products groups had the largest increases in severity.

Honors for Food Companies

National Safety Council has cited the following companies for outstanding safety accomplishments during 1934:

Bakeries—Southern Biscuit Co.: Best 1934 record among middle-sized units, 553,000 man-hours without a disabling injury.

Beverages—Canada Dry Ginger Ale, Inc.: Lowest 1934 frequency rate among large units, 6.63; also lowest 1934 severity rate, 0.14.

Canning and Preserving — Big Stone Canning Co.: The Arlington, Minn., plant worked more hours without a disabling injury than any other large unit with the perfect 1934 record of 84,000.

Fairmont Canning Co.: The Winnebago, Minn., plant is the largest unit to achieve a perfect 1934 record and thereby reduce both injury rates 100 per cent since 1932.

Vincennes Packing Corp.: The Hayden, Ind., plant worked more hours without a disabling injury than any other middle-sized unit with a perfect 1934 record, 55,000. The Elnora, Ind., plant worked more hours without a disabling injury than any other small unit with a perfect 1934 record, 28,000.

Central Wisconsin Canneries, Inc.: The Beaver Dam plant is the largest middle-sized unit to achieve a perfect 1934 record and thereby reduce both injury rates 100 per cent since 1932.

Cereal Manufacturers — General Mills, Inc.: The Gold Medal Foods, Inc., Chicago, a subsidiary, has the best 1934 record among large units, 442,000 man-hours without a disabling injury.

Canadian Postum Co., Ltd.: Worked more hours without a disabling injury than any other small unit with the perfect 1934 record of 225,000; this company also has made the largest improvement since 1932, 100 per cent in both injury rates due to its perfect 1934 record.

Confectionery Manufacturers — Peter-Cailler-Kohler Swiss Chocolate Co., Inc.: Lowest 1934 frequency rate among large units, 1.22.

Brock Candy Co.: Lowest 1934 severity rate among large units, 0.01.

Corn Products—Faultless Starch Co.: Best 1934 injury record, 33,000 man-hours without a disabling injury.

Dairy Products — Borden Co.: Borden's Cheese Co., a subsidiary, had the lowest 1934 frequency rate among large units, 4.88; also the lowest 1934 severity rate, 0.06.

Horn-Supreme Ice Cream Co., Inc.: Worked more hours without a disabling injury than any other middle-sized unit with the perfect 1934 record of 145,000.

Milling—General Mills, Inc.: The Washburn Crosby Co., Inc., Chicago, a subsidiary, has the lowest 1934 frequency rate among large units, 2.89.

Ralston-Purina Co.: The Nashville mill has the best 1934 record among middle-sized units, 130,000 man-hours without a disabling injury. The Woodstock, Ontario, mill has worked more hours without a disabling injury than any other small unit with the perfect 1934 record of 77,000. Elevator A at St. Louis has made the largest improvement since 1932 among small units, 100 per cent due to the achievement of a perfect 1934 record.

Sugar Refining—Atlantic Sugar Refineries, Ltd.: Lowest 1934 frequency rate, 1.05; lowest 1934 severity rate, 0.01; largest improvement in frequency since 1932, 92 per cent; largest improvement in severity since 1932, 99 per cent.

Other Food Products—Salada Tea Co.: Best 1934 record among large units, 384,000 man-hours without a disabling injury.

Peter Rossi & Sons: Largest improvement in both injury rates since 1932 due to achieving a perfect 1934 record and thereby reducing both rates 100 per cent.

Interior of deep-fat fryer showing immersion heater near bottom.

Immersion Heaters

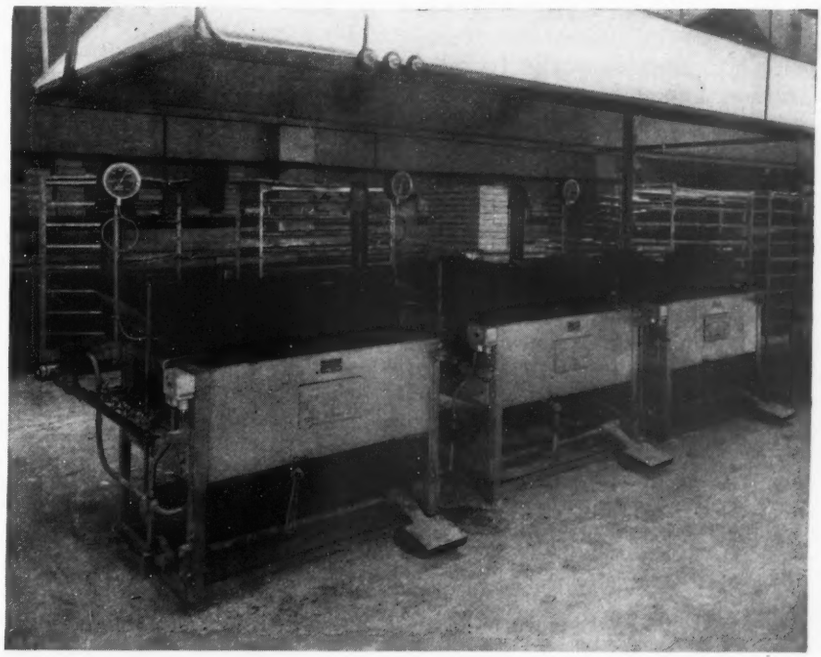
Cut Costs, Boost Quality

By C. W. SWENSON
New York, N. Y.

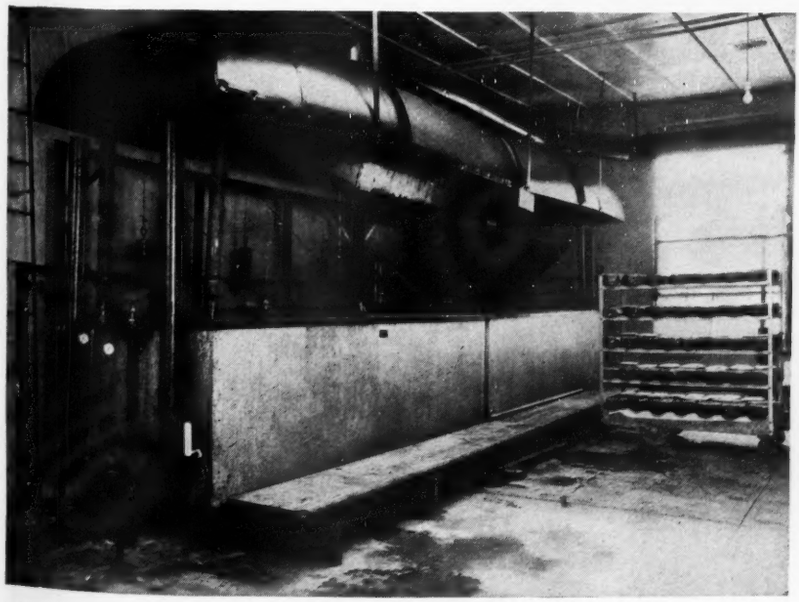
SAVINGS of from 25 to 40 per cent in fuel costs have been effected in deep-frying and other cooking operations by the use of gas-fired immersion heaters. Nor is that all. This type of equipment has provided more accurate process control and made possible more rapid and thorough cooking with a saving in grease consumption.

The immersion-heater cookers are equipped with fully-immersed internal heating coils. Burners of the venturi type, which provide the correct mixture of air and gas at all rates of burning, fire into the immersion tubes. To provide precision temperature control, the heaters are equipped with a mercoid switch which operates an electric solenoid valve. To effect complete heat utilization and provide more even heating, the tubes, which are about 1 in. above the bottom of the vessel, sometimes are designed to discharge into flues which pass around the bottom and sides of the tanks. The fuel for the immersion heaters is delivered to the burners under slight pressure by a booster, either of the fan or compressor type.

Among the deep-frying operations for which immersion units prove particularly efficacious are the cooking of doughnuts, potato chips and chow-mein noodles. In addition to deep frying, the heaters have been put to efficient use in such processes as the boiling of hams.



Battery of immersion-heated, potato-chip frying tanks. Note location of burners and temperature and gas-pressure gages.



Two immersion heated tanks in which hams are boiled. These cut fuel costs and provide accurate control of cooking.

The position of the immersion heating coils is important in doughnut frying, since it reduces the charring of sediment which settles from the grease. In the under-fired systems, heat is applied to the bottom of the tank. With this arrangement, the deposit of crumbs and dusting flour on the bottom gets scorched, the burned particles darkening the grease to such a degree that it must be strained and filtered at the end of a day's run. The carbonized sediment of crumbs and flour also impairs the efficiency of the under-fired fryer, because it acts as an insulator against heat from the flame. Not only is heat wasted in overcoming this insulating effect, but the life of the cooking vessel is shortened.

IN THE immersion-type fryer, no carbonization of sediment occurs, because the temperature on the bottom is lower than at the burner. Nor does sediment collect on the round tubes to impair the heat transfer. And since there is no burned sediment to circulate in the grease, there is no need to invest in pumping and straining equipment. Moreover, there is no loss of grease other than that absorbed by the doughnuts and evaporated from the surface.

The automatic temperature control with which these immersion heaters may be equipped permits thorough cooking of doughnuts without overbrowning and results in an even-textured product. A temperature of about 390 deg. F. is desirable for quick frying and low grease absorption. A drop of 15 deg. below this would give a doughnut which is light brown in color; a rise of 15 deg. would result in a very dark brown product. The maintenance of 390 deg. depends entirely upon automatic temperature control.

Table I: Doughnut Frying

Temperature of fryer.....	380 deg. F.
Number of pieces fried....	550 doz.
Gas consumption.....	1,420 cu.ft.
Electricity used by booster	3 kw.-hr.
Cost of gas per dozen.....	$0.0274
Corrected on pound basis...	$0.0135

Table II: Frying Potato Chips

Temperature of fat.....	330 deg. F.
Temperature to which fat drops.....	290 deg. F.
Time of batch.....	7 minutes
Pounds of chips per hour per compartment.....	38
Area of compartment.....	9 sq.ft.
Gas used per pound of chips	8.5 cu.ft.

Table III: Boiling Hams

Size of ham-boiling tanks..	10 ft.x45 in.x37 in.
Gas used to heat water to 180 deg. F.....	1,200 cu.ft.
Gas used to hold water at 180 deg. F. for 6½ hrs...	1,000 cu.ft.
Total gas consumption for process.....	2,200 cu.ft.
Gas consumption for two tanks.....	4,400 cu.ft.
Cost of gas.....	$4.40
Cost of gas per month.....	$123.20

The cardinal sin in doughnut frying is the production of greasy, soggy doughnuts. If the grease be only 20 deg. below the required frying temperature, it is "cold," and the doughnuts absorb excess fat, since they must cook longer. Here, again, automatic temperature control comes to the rescue.

Production data showing the amount of fuel used in an immersion-heater doughnut fryer in a typical plant are given in Table I.

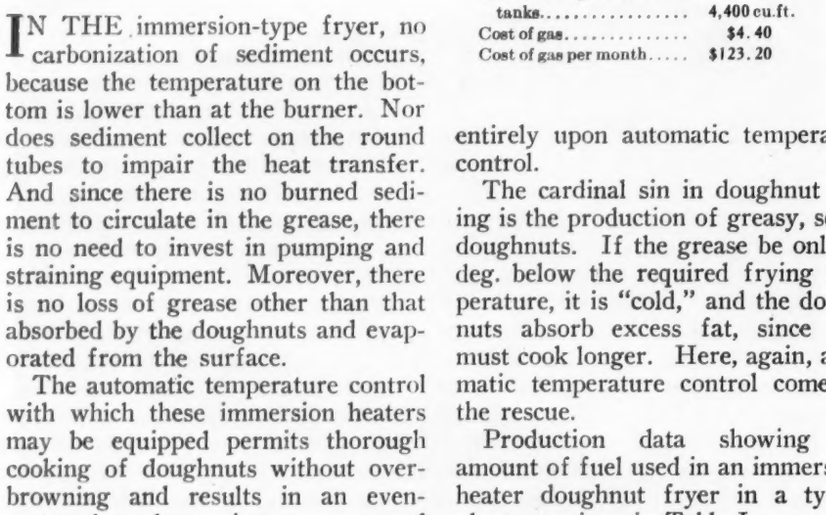
Deep frying of potato chips involves a condition not encountered with doughnuts. Since a potato contains approximately 75 per cent of water, the fryer must expell a great amount of moisture before the chips are cooked. The water must be removed quickly, in say from one to two minutes, or the frying will start and the moisture will be trapped, producing a soggy chip. The fryer must be designed to take this additional load without any appreciable drop in the fat temperature. And it is desirable to have a large amount of gas firing into the immersion coils.

Typical time, temperatures and gas consumption in the frying of potato chips are given in Table II.

Immersion heating also has improved the frying of the noodles used in making chow mein. One plant has cut its fuel bill by 35 per cent, reduced operating time, curtailed shrinkage and effected much economy in the oil used in frying by installing immersion-heated fryers. These units measure approximately 30x47x16 in. and cook 50 lb. of noodles in one batch. The noodles are placed in a wire-mesh container suspended over the fryer and operated by a hoist.

In boiling hams, the first consideration is even cooking. The possibility of underboiling or overboiling must be guarded against at all times. Overboiling causes waste and loss in profit, since meat is sold by weight, while underboiling creates dissatisfaction among consumers. In addition to a loss in weight, overcooking produces a streaked ham, as the overcooked fat has a tendency to penetrate the lean sections.

Practical plant experience has proven that gas-fired, immersion-heater tanks give uniform cooking. In the plant referred to, gas is supplied to the burners under a pressure of 4 lb. per sq.in. by air-cooled, rotary compressors, the burners having high-pressure inspirators attached to provide the correct air-gas mixture at all times. To conserve the heat and make for more economical processing, the tanks not only are covered but are insulated.



Immersion-heated doughnut fryers. An automatic temperature control regulates the supply of gas to insure proper frying.

THE use of this equipment affords some illuminating information on fuel economy with gas. As compared with solid fuel, the gas effects an annual saving of slightly more than $2,000. Before the plant turned to gas, it had to employ a licensed engineer at a minimum of $150 a month to operate its boilers, and it burned $120 worth of coal monthly. With $20 additional for ash removal, this gives a total of $290 a month with coal as fuel. With gas, as shown in Table III, the processing tanks were heated at a cost of $123.20 a month, the saving being $166.80 monthly.

*Use of nitrite and acid speeds cure and permits control of bacterial action.**

Acid Cure for Meat

By LLOYD A. HALL

Consulting Chemist, Chicago, Ill.

IMPROVED control over the speed of curing and over the flavor of cured meats can be obtained by the use of acids at certain times and places during the curing process. A preservative acid material is preferred for this purpose, but an acid and a preservative may be used. The following is an example of an acid pickle composition for curing green hams, anhydrous citric acid being the acid material added: sodium nitrite, 0.90 per cent; sodium nitrate, 0.60 per cent; sodium chloride, 97.65 per cent; anhydrous citric acid, 0.85 per cent. Other acid substances may be substituted in this formula, and the amount may be increased or decreased.

The action of the added acid material is to speed the conversion of the nitrite to nitrous acid, the latter being the element which combines with the hemoglobin to form the red coloration which gives cured meat an appetizing appearance (1)(2). When the acid is of the preservative type, it also asserts a preservative action.

In curing processes where nitrate is used, the nitrate is reduced to nitrite by a bacterial reducing process (3), and acid may be formed at the same time. When nitrite is thus formed, or when nitrite is used initially without nitrate, the nitrite is available so that the acid, which is either present in the meat or is formed in the process, releases nitrous acid to react with the hemoglobin (4) (5) (6) (7) (8). Unsatisfactory or insufficient formation of nitrite invariably results in improper or irregular color fixation. Furthermore, when nitrate is used without nitrite, time must be provided for the bacteria to produce nitrite.

Not only is formation of the nitrous acid-hemoglobin compound to be considered, but also the flavor of the meat. If the curing process is too long, undesirable flavors may be created (9). Flavor also is affected by the kind of bacteria which function, and bacteria are definitely favored according to the alkaline or acid condition (the hydrogen-ion concentration or pH) maintained.

The choice of the acid, or acid salt, for this process depends to a considerable extent upon the pH, or hydrogen-ion content, desired to provide a regulatory influence on the bacterial actions which take place. Arbitrary procedures may be adopted to develop a particular trend toward a distinctive flavor. Bacterial innoculation may even be resorted to for the predominance of particular strains.

THE essential reactions may be permitted to take place before the product to be cured is placed in contact with the curing agent containing the preservative acid, or the meat may be placed in contact with a curing agent devoid of preservative acid. In the latter case, the preservative acid may be added to the product in the curing process, thereby inhibiting further bacterial action and hastening curing; or, if desired, a non-preservative acid may be added with the result that the curing step is speeded and the time during which the bacteria may act is lessened.

As preservative types of acid material, free acids may be used, such as tartaric acid, citric acid, malic acid, lactic acid, benzoic acid, salicylic acid, or acid salts, such as sodium bitartrate and mono-sodium acid phosphate. Acid salts of other alkali metals, such as potassium, may be substituted instead of the salts of sodium. The following equation typifies the reaction of the acid with the nitrite: $3NaNO_2$ (sodium nitrite) $+$ $H_3C_6H_5O_7$ (citric acid) $\rightarrow$ $Na_3C_6H_5O_7$ (sodium citrate) $+$ $3NHO_2$ (nitrous acid).

Examples of the non-preservative acids are hydrochloric, nitric, sulphuric and acetic acids, these being used together with sodium citrate, sodium benzoate or other preservative salts.

Usually, curing processes of this nature are carried out in the presence of common salt or brine of sodium chloride, which in itself has some preservative action. It should be understood, however, that too much salt cannot be left in the meat without making it too salty, and where an acid is added, a preservative type is used which has distinctly higher preservative power than sodium chloride.

In applying this process, it is preferable to employ a liquid pickle, as the water provides sufficient dilution to avoid material loss of nitrous acid. It also provides for uniformity of concentration and of action.

The curing materials included in the formula mentioned above may be thoroughly mixed together and maintained without loss of efficiency if kept dry and in an airtight container. While it is not necessary that exacting proportions be used, it is preferable that the available acidity be greater than the equivalent of the amount of nitrate initially employed. Then there is left acid material to react with the nitrite formed from nitrate. It should be understood that acid present in the meat, or formed in the process, may be somewhat effective, which is why the proportions of the formula are not critical.

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*From a paper presented before the Division of Agriculture and Food Chemistry at the 89th meeting of American Chemical Society, New York, N. Y., April 22 to 26, 1935. Patents covering this process applied for.

Systematic observance of personal cleanliness and plant sanitation, thorough sterilization of equipment, and adequate refrigeration of materials in process and finished products are important aids in the prevention of "food poisoning" outbreaks.

Can Cream-Custard Pastries Be Made Safe?

By J. C. GEIGER and J. P. GRAY
Department of Public Health, San Francisco, Calif.

EPIDEMIOLOGIC studies and bacteriologic investigations of several "food poisoning" outbreaks definitely indicate that cream puffs, chocolate eclairs, and custard layer cakes are some of the sources of infections. During recent years these "food poisoning" outbreaks have occurred with a frequency that is disconcerting not only to the public health officials but also to the baking industry as a whole; so much so that in some instances the preparation, production, distribution, display, and sale of any and all cream-custard pastries have become rigorously supervised and regulated or completely prohibited, particularly during the hot seasons of the year.

The 1935 Westchester County (New York) outbreak, in which several hundreds of persons were affected, was so great that it undermined the goodwill and sales volume of the responsible baking company and even became the basis of legal actions for personal damages in several instances.

One might well ask: "Why should cream-custard pastries be so frequently involved in these 'food poisoning' outbreaks?" Also, "How can cream-custard pastries be made safe during all seasons of the year?"

First it is pertinent to point out that this type of food product is especially well adapted by composition to harbor the microscopic organisms or bacteria that cause the illness. The usual cream-custard filling, made of milk or cream, eggs and sugar, and possibly cornstarch, is heated at relatively low temperatures for comparatively short periods of time, and consequently is but partially cooked and sterilized. If "Grade A" milk, properly pasteurized and safeguarded, is used, there is but a remote possibility that the custard is contaminated from this source. Eggs, if in wholesome condition and acceptable for use, offer an even more remote possibility as a source of infection. Sugar and cornstarch, likewise, may be dismissed as sources of contaminating bacteria which might be related to "food-poisoning." But the finished product, the custard itself, provides one of the best natural culture media for certain types of bacteria including those groups more frequently involved in outbreaks of "food-poisoning." All that is necessary for the entire batch of custard to become a living culture and to serve as an excellent vehicle for the "food-poisoning" agent is that the bacteria be introduced into the custard, even in very small numbers. Once the bacteria are in the custard they grow and reproduce themselves very rapidly under the conditions of incubation afforded in many bakeries where the custard is set aside, usually on an open shelf, in an uncovered container and left to cool and to "mature." Within this period of from a few to several hours the few bacteria that were unconsciously and accidentally introduced during the preparation of the custard have multiplied to form almost countless numbers of bacteria. For this reason the custard should always be allowed to cool only in properly cleaned and sterilized closed containers under refrigeration.

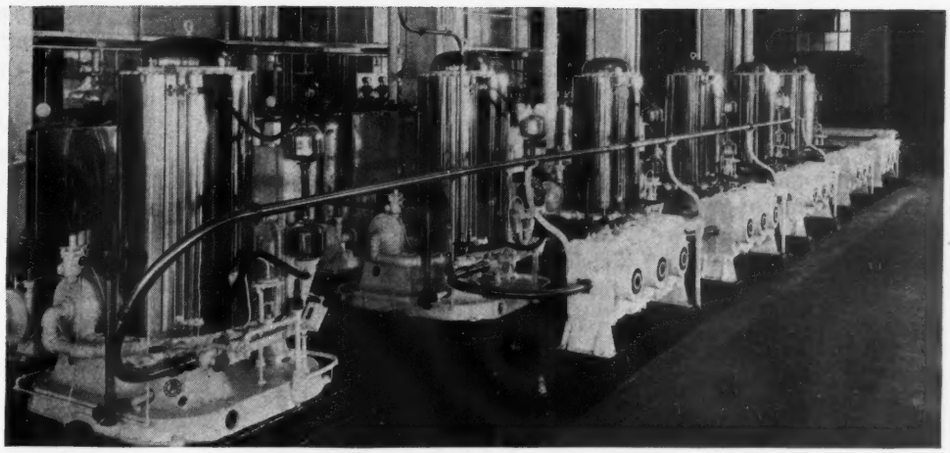
Second, it should be realized that in the manufacture of cream-custard pastries the custard is handled by direct spreading in layer cake work or in various types of devices for injecting the filling into pastry shells as in cream puffs and eclairs. This step affords several possibilities for contamination of the custard filling. In our own epidemiologic and bacteriologic studies made in San Francisco outbreaks involving cream-custard pastries, the cloth-bag type of device was definitely incriminated. Even with meticulous care in washing and sterilizing the cloth bag by boiling, this type of equipment is unsatisfactory because of the previous character of the moistened cloth, which permits bacteria from the operator's hand to contaminate the custard during the filling process. Paper bags of impervious material, usable only once and discarded after use, are far more satisfactory. However, the nozzle, and the spoon or cup used to fill the bag, must be most carefully cleaned and sterilized by boiling just before use, in an effort to minimize the possibilities of contamination from these sources. Cleanliness of the operator, at all times, in his handling of the custard and equipment, is of the greatest importance.

Certainly not less important than the steps that have been outlined as sources of contamination of the custard filling are those of handling and storing the finished product from the time it leaves the bakeshop until it is eaten by the consumer.

THE importance of standard quality ingredients, care and cleanliness of employees in their handling of the product, and utilization of refrigeration for cooling the custard before the injection of the pastry shells cannot be over-emphasized. However, these constitute but a part of the complete sequence of events.

The distribution of the product by truck, usually on trays in a closed body compartment, from the bakery to the retailer is not without its hazards. Certainly the display and handling of the product incident to its sale present very definite opportunities for contamination. The product certainly should be covered during its transfer from the refrigerated store-

(Turn to page 566)



Ultra-violet irradiation is employed as final safeguard to assure complete sterilization of water used in carbonated fruit juice beverages. Five ultra-violet units are on the left. The vertical cylindrical units are carbonators.

Supplying Pure Water
for Beverage Manufacture

By E. S. STATELER
Associate Editor

WATER requirements for a beverage plant include those for cooling, cleaning, and boiler feed as well as for ingredient purposes.

In all instances an adequate supply at a reasonable cost is of primary importance. This factor, particularly, is of first consideration in connection with water used in the cooling and cleaning operations. However, the factor of reasonable cost also holds for ingredient and boiler feed water, even though the volume used for these purposes is relatively small in comparison with that used for cooling and cleaning purposes. To be sure the quality of an easily accessible supply of ingredient and boiler feed water can be raised to the desired level by mechanical, chemical, and light or heat treatment methods. But the expense might easily be so excessive that abandonment of an existing supply for a new one would be advisable, even if such a step involved the moving of the plant to a new location. Excessive cost of purifying ingredient water has been responsible for the deliberate closing down of carbonated beverage plants.

Adequate supply of water was the problem faced by Hoffman Beverage Co., Newark, N. J., a few years ago when it enlarged its plant to supply the available market for its products.

From the beginning days of the company over twenty years ago city water mains had been the source of supply. As these mains had been built to meet a residential demand their capacity would be wholly inadequate to carry an increased load for the enlarged beverage plant. The laying of new and larger mains to supply the required volume of water would have entailed a great expense and even then very likely would not have been of sufficient capacity to meet the growing demand for more water as the plant continued to expand with the succeeding years. The latest addition is an ale and beer brewery put into operation in late 1934.

In addition to the uncertainty of volume supply there were the added factors of quality and temperature. The range of these factors varied widely with the seasons of the year and they were at their worst when the carbonated beverage season was at its peak and the demand for water greatest.

TO OVERCOME these difficulties the present water supply system was installed by drilling about 600 ft. into a solid rock formation and tapping a supply of water which is relatively constant in supply, mineral content, and temperature, and practically free from organic and micro-organism content. It is free from objectionable occluded gases.

At present this water supply consists of three wells equipped with deep-well, turbine-type pumps which deliver 700, 600, and 450 gal. per minute, respectively. These pumps are water lubricated and are of stainless steel shafting and bronze impeller and casing construction. Each well is sealed off for 40 ft. below the surface to prevent seepage of surface water. The temperature of this deep well water is about 54 deg. F. even during the hottest summer weeks and from year to year.

With a total pump capacity of 1,750 gal. per minute this water supply is more than adequate to meet the total plant demand. However, provision is made in the plant for the reuse of cooling water so that even though the total water demand of the plant should exceed the delivered capacity of any two of these pumps there would be no shortage of water. By so doing one well can always be available as a reserve source if for any reason there is a sudden demand

for more water than the usual plant requirements. Also, in effect, one well serves as a standby unit to meet the emergency of a pump going out of commission. Incidentally, these pumps are hooked up to the production line in such a way that they are always under automatic control of a central pilot make-and-break switch which speeds up or slows down the water flow to meet production demands.

The water which comes in for reuse is that used in the jackets of the glass-lined syrup tanks and for other units where the volume of water run through the cooling coils is relatively large and the rise in temperature is only nominal. While the water supply is plentiful and the expense of getting it relatively low per gallon used there is an economy in running a large volume of the 54 deg. F. water through the cooling coils at high velocity and then using this slightly warmed water for refrigerant condensing purposes.

ALTHOUGH this deep well water is virtually free from micro-organisms no step of purification is omitted because of the deteriorating effect a yeast, mold, or bacterial infection would have upon the natural fruit juice beverages. These beverages must be processed with the greatest of care to prevent microbiological infection.

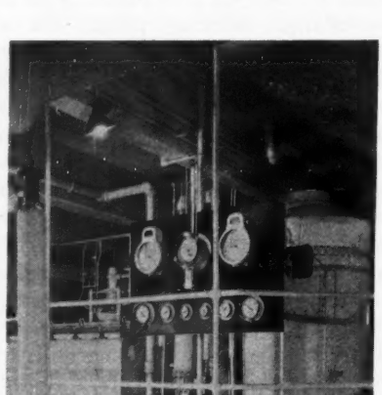
To bring the ingredient water to the desired character and pH value which will make it satisfactory for all of the flavors of carbonated beverages it is given zeolite treatment to convert the natural calcium and magnesium salts content to sodium salts of soft water character. These softening units are in no sense water purifiers as far as the organic or micro-organism content of the water is concerned. In fact, unless precaution is taken they may become not only a source of infection but actually a culture bed for microbiologic growths. In the Hoffman plant this possibility is avoided by periodic sterilization with a highly effective agent which is certain to come in contact with all water-treating areas of the zeolite unit and which is easily and completely removed by washing. The frequency of these periodic sterilizing treatments depends upon the volume of water used.

Following the zeolite treatment of the ingredient water to adjust its mineral content to the character and pH value upon which all the individual beverage formulas are based, the water goes through a series of treatments to destroy and remove all micro-organisms that might be in the water as it comes from the pumps.

These treatments consist of filtering the softened water through plate filters whose filter cloths are covered with diatomaceous earth; of ozone treatment to destroy micro-organisms; of passing through ultra-filters of multi-plate type to remove not only the residue of micro-organisms destroyed by previous sterilizing treatments, but also to pick up stray micro-organisms which might get into the water line through valve connections or from the refrigerating units; and of irradiating with ultra-violet rays as a final safeguard to assure complete sterilization.

SINCE the flow of ingredient water through the plant is at the rate of approximately 20 gal. per minute for each sterilizing unit, there is very little likelihood of micro-organic life being accidentally introduced in the lines, yet these precautionary steps are taken not only to avoid the introduction of micro-organisms into the bottled beverage, but also to forestall the introduction of microbiologic contamination into the refrigerating, storage, carbonating and filling units.

Throughout the plant easily demountable piping of stainless steel, pure nickel, and industrial glass with the dairy sanitary type of fittings and plug cocks is used as are also demountable filler valves. These details of construction are valuable aids to keeping the finished beverages free from micro-organism contamination.



Before carbonation the temperature of the water is lowered from about 40 deg. F. to 33 deg. F. in a steam-jet vacuum type refrigerating unit.

Coincident with the treating of the ingredient water to eliminate the possibility of microbiologic contamination is its conditioning to get the desired carbon dioxide retention and minimum degradation of flavor in the finished beverage, especially in the orange, lemon, and lime beverages, whose natural aromatic ingredients are unstable in the presence of atmospheric oxygen. Various methods of obtaining these results have been tried with a varying degree of success. Two-stage refrigeration in a closed system supplementing ultra-filtration has been found most successful.

As the water comes from the pumps it has a temperature of 54 deg. F., which is unusually low for an incoming water, and because of its deep-well origin has only a very low carbon dioxide gas content. As the water passes through the various steps of storing, softening, and sterilizing the temperature rises a few degrees, but before there is much opportunity for a marked increase in air content it is brought to 40 deg. F. by direct cooling in a centrifugal type refrigerating unit (FOOD INDUSTRIES, May, 1931, p. 186) and subsequently lowered to the optimum carbonating temperature of about 33 deg. F. in a steam-jet vacuum type of refrigerating unit. Both of these refrigerating units are constructed so as to be easily cleaned and sterilized to avoid microbiologic culture growths.

Another feature in favor of this closed two-stage refrigeration system is the absence of any likelihood of the water becoming contaminated by the refrigerant. The centrifugal unit of the first stage, a shell and tube construction, uses a low pressure refrigerant which prevents the possibility of leakage of refrigerant into the water. In fact, the relative pressures and arrangements are such that the tendency is for the water to pass to the refrigerant and not vice versa.

The final stage unit is of the steam jet vacuum type, in which the near-freezing temperature of 33 deg. F. is obtained through evaporation of the ingredient water and without danger of freezing up or icing over any portion of the heat transfer surfaces as would likely occur with a cooling coil unit. Also in this type unit there is no exposure of the water to atmospheric gases and it has a very stable and automatic temperature-holding performance.

This is the third of four articles on European dairy manufacturing and marketing practices

An American Looks at

Dairy Plants and Equipment in Europe

By H. A. BENDIXEN

Associate Professor of Dairy Husbandry, State College of Washington, Pullman, Wash.

THE European consumer does not seem to lay as much stress on the thickness of the cream layer on the milk as does the American consumer. In Germany I have observed flash pasteurized milk without a cream layer at all, advertised as milk "just as it comes from the cow." In Vienna, a large milk plant flash-pasteurized its milk at 185 deg. F., separated it, homogenized the cream, and remixed the hot cream and skim milk, thus destroying the creaming ability and producing a very smooth, rich-looking milk. In Holland practically no creamed milk is sold and in England some milk is sterilized which, of course, destroys the cream layer.

Plate pasteurizers, together with pocket-holders or holding tanks, were widely used in the better and larger dairies. Short-time, higher temperature pasteurization was awaiting legalization and was already in use in some plants. Holding from one to ten seconds at 165 deg. F., 5 to 16 seconds at 163.4 deg. F., 12 to 26 seconds at 161.6 deg. F., 20 to 39 seconds at 159.8 deg. F., and 32 to 55 seconds at 158 deg. F. was found in experiments to be entirely satisfactory from the standpoint of preservation of the cream line. In some of the newer types of plate holders, special holder plates have been built into the machine. Plate heaters require little space, are easily cleaned and highly efficient in the use of heat, with 80 per cent of the heat being saved in regeneration. Their capacity runs 200 to 2,600 gal. per hour, and may be increased about 33 per cent by the simple addition of more plates. They may consist of rectangular plates arranged in a vertical position, or of circular plates placed on top of each other or of plates of a shape like separator disks, placed side-by-side instead of on top of each other. The first mentioned is the more common type. Plates and dividers are usually made of stainless steel, chromium-plated; or of tinned brass. Drip rings prevent all possibility of raw and pasteurized milk becoming mixed in the machine. Coil vats were not found.

Foam destroying milk pumps were used in most plants and seemed to be very effective. Refrigeration in many of the small plants is supplied by carbon dioxide machines, although ammonia is commonly used in the larger ones. Many of the smaller plants use steam engines instead of electric motors as prime movers.

EUROPEAN dairy machinery in general impresses one as being well constructed and substantial. Stainless steel, Zeppelin duralumin, tinned-copper and glass-lined equipment were commonly used.

In visiting a number of small dairies as well as many of the large model plants in Germany in Hamburg, Berlin, Nuremberg, Mannheim, and elsewhere, one is impressed by a generally neat and pleasing appearance. Glazed tile walls, special tile floors, glass partitions, skylights, ventilating systems, neat arrangement of piping and electric conduits, well-painted walls and clean, shining equipment, were encountered in most plants. Even the boilers are frequently set in glazed tile and sometimes the large milk storage vats are similarly enclosed.

The plant at Stuttgart uses very nearly the same type of equipment as the United Dairies plant in London, namely, the plate heater system. Vacuum and compressed, filtered air, replaced milk pumps. Double compartment filters were used and about 5,300 gal. of milk were handled per hour. A large plant in Hamburg, which was a consumer cooperative, used tubular heaters with pocket holders and glass-lined storage tanks. All equipment, except the storage tanks, inclusive of the piping was made of stainless steel. Bottle fillers are similar to those used in the United States. A commonly used bottle cap is aluminum and covers the lip of the bottle. It can be easily removed by tearing. Thus it complies with the milk law which requires a tamper-proof cap to prevent use a second time.

A number of plants visited were partly city owned and controlled. That at Mannheim, supplying a city of about 250,000 people, had 50 per cent of the capital stock owned by the city, 30 per cent by producer organizations and 20 per cent by city milk dealers. This central plant buys all of the milk coming into the city either directly from producers or from dealers who peddle the milk out after it is processed. High acid milk is made into cheese. Surplus plants have been established in the country to take care of the flush season. The plant has been quite successful, producing high quality milk at a fair price.

The Nuremberg plant is similarly organized and supplies a population of nearly 400,000 people. Here the city owns 60 per cent of the capital stock, the producers 26 per cent and the dealers 14 per cent, but it was stated that the intention is to give the producers a greater share of the control. The plant is supplied by 200 cooperatives and many other independent small plants. Of the milk received about 20 per cent was made into manufactured products, butter, cheese, processed cheese, dried milk, yoghurt, lactic acid, and casein. This plant seemed to be very successful. In a number of other cities, I heard the central milk plant has not proved successful.

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Beer Quality Improved by Newer Methods for

Hops Removal

Rapid and continuous straining of the hot wort direct from brew kettle through enclosed unit with relatively small filtering area cuts time of contact of wort with the hops, prevents loss of volatile hop aromatics, avoids contact of hot wort with oxygen of air, gives greater yield of wort per 100 lb. of hops, and reduces quantity of high-quality hops necessary to give the desired flavor and aroma.

By GEORGE DEFREN
Consulting Chemist, Newton, Mass.

THE WISDOM of adopting new types of equipment was just beginning to be appreciated by brewers when the prohibition experiment, "noble in purpose," came into being. During this thirteen-year period the brewing industry was so dormant that the swift repeal of prohibition two years ago caused a feverish and hurried reconditioning of closed plants.

In most cases old equipment was utilized to meet production requirements; new installations were made only when the used equipment was hopelessly antiquated and deficient. Today the industry is casting aside some of its promotional aspects and is beginning to establish an improved technical foundation. Many of its old features are being replaced by newer developments which give better results.

Among such developments must be mentioned a more efficient extraction and disposition of an important constituent of beer and ale—hops—which is added to the wort to precipitate coagulable protein and to impart its own characteristic taste and aroma to the beverage.

THE general practice has been to run the entire finished brew of the hopped wort into a strainer, the so-called "hopjack," in which the hops and coagulated proteins settle out on a perforated false bottom. After a period of one-half to three-quarters of an hour, when this settling has reached the desired stage, the supernatent hot wort is filtered through the hops and then cooled for "pitching" with the yeast. Then when the residue in the hopjack has cooled, the spent hops are shoveled through a hole in the floor and carted away or surreptitiously dumped into a convenient sewer.

This older method requires prolonged standing of the wort in contact with the hops until the hops have formed a filtering bed. Usually the long contact of the wort with the hops results in extraction of some "hard" resins and other undesirable constituents of the hops to impart a rank bitter taste to the finished beer.

Some progressive brewers introduced a system of separating the wort from the hops by a strainer in the kettle fitted over the outlet. Others made use of a combination filter and press in an effort to control the degree of bitterness imparted to the wort by the hops.*

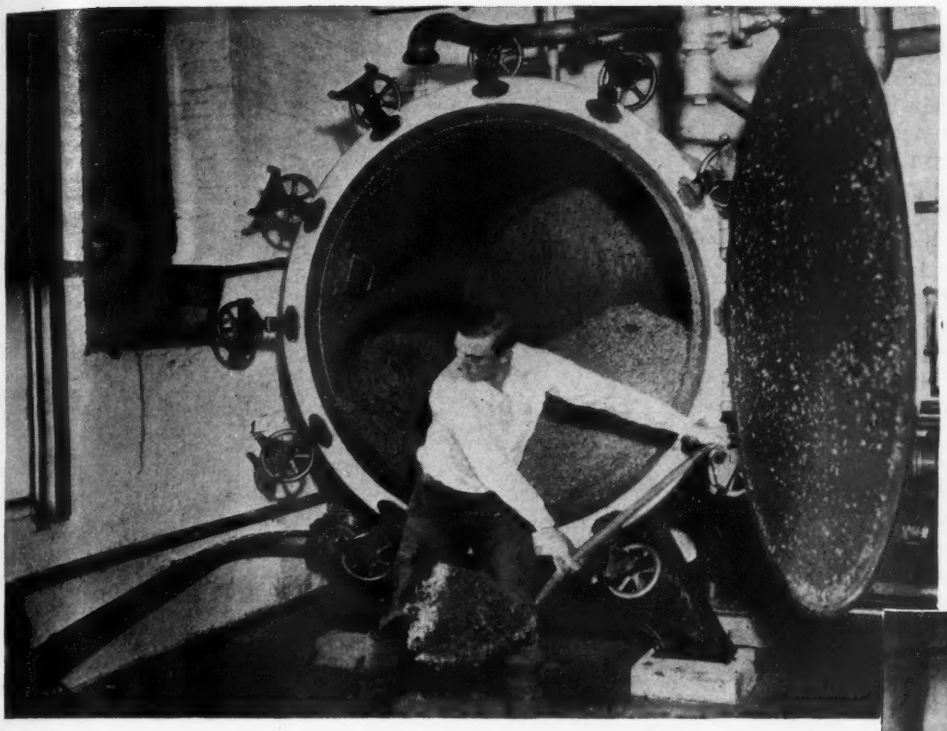
SHORTLY before prohibition an improvement was made on the strainer-inside-the-kettle idea by Hans E. Zobel, Brooklyn, N. Y. In his unit the strainer consists of a horizontal cylindrical steel or bronze shell with a tightly fitting door and a perforated copper or a slotted Everdur straining basket. This shell is also fitted with a pressure gage, a gage glass, an inlet and outlet connection of equal size in the door and outer shell at the top and bottom. It rests on two cast-iron cradles and may be installed directly under the brew kettle.

This unit comes into use after the brew is finished and the steam reduced sufficiently to keep the hops gently in motion. From the brew kettle the wort flows through the hop strainer either by gravity or pump action in such a manner that the hops act as a filter bed. They are caused to settle quickly and solidly against the inner surface of the lower half of the slotted basket by the downward pressure of the wort above. The upper half of the strainer is thus left free and unobstructed to strain the remaining wort, also containing hops in suspension, as it comes from the kettle. Here, too, the strained-out hops serve as the filtering medium. The filtered wort is run off the top of the strainer until the kettle is empty. Then the bottom outlet of the strainer is opened to permit draining.

The clear wort is pumped away continuously to be cooled as rapidly as the capacity of the piping permits; 1,000 bbl. per hour is not uncommon. There is no opportunity for the hops to get cold while in contact with the wort, nor is there any mechanical force or pressure exerted upon the hops to cause extraction of any portion of the hard, bitter-taste-imparting resins of the hops commonly held responsible for the objectionable after-taste so frequently found in both foreign and domestic beers.

AS SOON as the brew has been run through the strainer, the inlet connection over the door is disconnected, the door opened, and the hops removed from the strainer basket. After removal of the hops, the strainer basket is pulled out on a truck for cleaning. The truck is so designed that the basket may be revolved on ball-bearing rollers so that

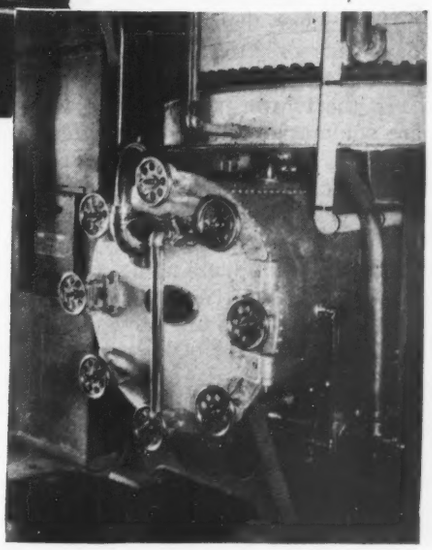
*FOOD INDUSTRIES, December 1934, pp. 542-54, 554.

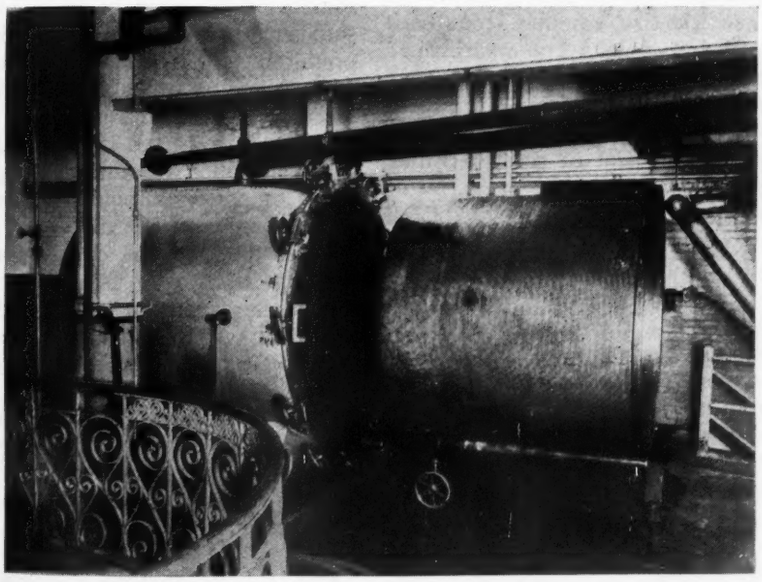


Various means may be used for removing the drained spent hops from the strainer. Dobler Brewery, Albany, N. Y., uses the traditional pitchfork.

Linden Brewery, Inc., Lindenhurst, N. Y., kept its installation costs to the minimum by placing the hop strainer directly under the brew kettle.

Kings Brewery, Inc., Brooklyn, N. Y., utilized unused floor space by having its hop strainer located remote from the brew kettle. For thorough washing and scrubbing the strainer basket is pulled out onto a wheeled truck.





every part of the strainer becomes easily accessible for brushing and rinsing and capable of being cleaned with one-third the labor required to clean the ordinary hopjack.

During operation a vent permits the air in the shell to be driven from the strainer when the wort is let in. Only in this way does the wort come in contact with air. The exposure is so slight that the oxidizing action of air upon the wort is kept to the minimum. Also as the wort is practically boiling when it enters the strainer, it is delivered to the gathering vessel or cooler in a sterilized condition. With such a free flow of the wort through the strainer and out of contact with air, extraction of all the desirable hop properties takes place while a larger percentage of the coagulated protein—albuminoids—is filtered out. The result is a brilliant finished wort without loss of any of the volatile aromatic principles of the high quality hops.

ONE such hop strainer can handle six or more brews daily from one kettle or from a battery of kettles and requires less space than the old-time hopjack; consequently it is more effective in its operation. Users of this unit claim an appreciable saving in hops and in addition the delivery of about three barrels of additional wort in the settling tub for every 100 lb. of hops used. This saving is accounted for by the hops being pressed hard into the strainer by the weight of the beer above. The compact design of the unit gives a relatively small filtering area for the volume of wort handled which, according to the manufacturer, is greater than can be obtained from the large filtering area of the hopjack. This feature of design is employed to best advantage by straining the wort as it comes hot direct from the brew kettle. The moisture content of the spent hops is reduced by approximately 85 per cent.

When Standard Analysis Does Not Help

By A. B. KENNEDY
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ASKED several years ago to analyze a sample of ground coffee to determine whether or not it was adulterated, and, if so, with what and how much, I found that my experience as a food analyst gave me only a superficial knowledge of the problem. As reference to standard works failed to reveal any facts useful for my purpose, I turned to the files of technical periodicals and food journals, and there found the key to my problem in the "Trillik Number." This test, a determination of solubility in boiling water, gives 24.82 to 26.16 per cent for 16 genuine coffees, and from 40.32 to 96 per cent for 14 substitutes. A per cent, or "T" number, less than 25, indicates the presence of exhausted coffee grounds; substitutes having a lower "T" number than coffee; or black, damaged, or inferior quality coffee incompletely roasted to avoid ignition.

In the two tests, reports of which are summarized here, various tests—physical, chemical, macroscopic, microscopic, and organoleptic—were applied. Though some of these may seem to be unorthodox, they were of much help in interpreting the total findings. Also, the trend of the investigation was limited by the time and facilities available to me. It pleases me to call the entire procedure an "inferential" analysis. By inference alone can the interpretation of some findings be justified.

In the following reports sample "B" is an average sample of ground coffee, similar in nearly all respects to sample "C" (supposed to be adulterated). Samples were of the same origin, and supposed to have undergone the same roasting and grinding procedure and to be of the same "age." Report of Test No. 1:

a. Sample "B" lighter in color than "C".
b. Sample "B" less odorous than "C".
c. Sample "B" had a natural pleasant taste associated with a pure, well-roasted coffee. Sample "C" had a strong, bitter taste that tended to mask the coffee flavor and suggested burnt sugar.
d. Iodine test failed to reveal starch. Microscope showed no chicory in fields examined.
e. Even at 20 diameters magnification, a foreign substance was revealed in sample "C".
f. Angle of repose was different for two samples, "C" indicating presence of a "binding" material.
g. Sample "B" appeared "free" and dry, while "C" appeared "sticky" and slightly moist.

The evidence presented by these findings indicated that an adulterant was present with the following properties: pronounced coloring power of a reddish brown nature; hygroscopic; sharp, bitter taste; and fine particle size, ranging from 1/10 to 1/20 that of the average particle of ground coffee. These properties suggested a substance similar to caramel. But caramel in limited quantities is a normal constituent of roasted coffee, roasted chicory, roasted grain, burnt sugar, dried blackstrap molasses and other materials. Also, caramel is a very complex mixture of organic chemical compounds as yet not well understood. Therefore, the identification of caramel with respect to its source is a matter of correlating data from a number of chemical and physical determinations and observations. The data for this purpose were obtained in Test No. 2, as follows:

1. Ash from "B" and "C" were virtually the same, except that for "C" was slightly darker in color.
2. Alkalinity of ash from "B" and "C" identical.
3. Salinity of two ashes in aqueous solution the same.
4. "T" number was 25 for "B" and 29.6 for "C".
5. "B" had a pH of 5.5, "C" had a pH of 5.3.
6. Moisture and volatile at 105 deg. C.: For "B" = 4.45 per cent; for "C" =3.74 per cent.
7. Reducing substances as dextrose: "B", 2.08 per cent; "C", 4.00 per cent.
8. Total extractable by anhydrous ether, ethyl alcohol and distilled water, in that order: "B", 31.8 per cent; "C" 37.5 per cent.
9. Turbidity of aqueous extracts normal for "B", very pronounced for "C".
10. Color of aqueous extract, Hess-Ives tint photometer: When "B" was made equal to 100, "C" equaled 219, for same concentration.
11. Color of alcoholic extract reflected same ratio as (10).
12. Color of ether extracts the same for "B" and "C".
13. Refractive index of aqueous extract, by Abbé refractometer at room temperature, slightly lower for "B" than for "C", but above that for distilled water and approximately that of caramel solution of equal concentration.
14. Specific rotation (optical), by polariscope, showed no appreciable rotation for either "B" or "C" solutions.
15. Specific gravity of aqueous extract, by Westphall balance showed "B" slightly lower than "C".

Items 1, 2 and 3 indicated that any substance added was organic, free from mineral ash.

Items 4, 7, 8, 9, 10 and 11 indicated the presence of an appreciable amount of some substance foreign to coffee. Item 4, the "T" number, was most significant, being too high for "C." Item 7 tended to confirm the presence of caramel or a related substance. Item 8, as did items 6 and 7, showed a greater amount of ether and alcohol soluble in "C" than in "B"; but insufficient data was at hand for interpretation. Items for 9, 10 and 11 were of value only in the interpretation of the gross results.

Items 5, 13, 14 and 15 indicated that some substance was altering the properties of coffee, although this implication was very delicate. Item 5 indicated the presence of a substance tending to increase the acidity of a cold water infusion. Items 13, 14 and 15 gave indications of doubtful value when taken separately, but fitted into the general picture.

Item 6 was definitely contradictory to the other findings, and failed to support the inference of item (g); but no doubt had a bearing on the findings of item 8.

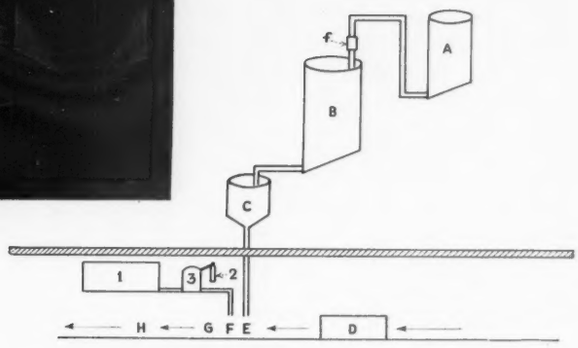
ASSUMING that the unknown substance present in "C" was caramel, then the following conclusions could be drawn: Items 1, 2, 3 and 5 indicated it to be a result of the caramelization of a pure organic substance and not of blackstrap origin. Item (d) seemed to preclude the possibility of "vegetable origin, as from flour, grain, peas, chicory, etc., for the caramel.

Items 4, 7 and 10 permitted calculation of the approximate quantity of caramel present, 4 and 7 checking closely. Item 10 showed an apparent discrepancy, explained by the fact that the coloring power of caramel

(Turn to page 572)

Left: Technical control of and research on Celo Company's entire line of concentrates and syrups is centered in its chemical and bacteriological laboratory.

Fig. 1: Diagrammatic flow chart of a carbonated beverage plant showing equipment units and point of ingredient additions and processing for the different steps in production operations.



Laboratory Control

Improves Quality of Carbonated Beverages

By LAURENCE P. GEER
Chief Chemist, Celo Co.
Tampa, Fla.

In addition to keeping a check on quality of products at various steps in production operations the chemical and bacteriological staff of the Celo Company do research and conduct monthly sales meeting to help sell the company's products.

ELEVATION of "soda pop" to the status of carbonated beverages in consumer consciousness is largely due to the establishment and maintenance of manufacturing standards which for the most part have been set up by the industry for its own betterment. These standards of wholesomeness, of protection against spoilage, and of uniformity in flavor and appearance are of benefit to the manufacturer, the dealer and the consumer alike.

Laboratory control of manufacture to insure quality and uniformity is exemplified by the Celo Company of America, which maintains a chemical and biological laboratory not only for the manufacture of the syrups and concentrates, but also for a daily routine check on each step of the bottling process in its headquarters plant. The laboratory acts also in advisory and consulting capacity for the company's subsidiary bottling plants in Florida, Alabama and Georgia.

In the manufacture of flavors and concentrates the laboratory samples each batch of the finished items and makes the usual tests, including a check of pH, specific gravity, permanence and density of the cloud, color, and concentration of pulp. In addition, a sample batch of syrup is made from the flavor or concentrate and is bottled with carbonated water so that the finished product made from the new batch may be tested. Examination of sample bottlings include the test for flavor and general appearance. The samples are then set away for a period of from one week to two months depending upon the product being observed. At the end of the period notations are made of characteristics appropriate to each beverage. For instance, in the case of fruit juice beverages it is important that no marked darkening and change of flavor take place, and emulsions and clouds must not separate. In the case of transparent beverages, such as ginger ale and imitation grape, the bottles must remain clear and free from sediment and "floaters."

The process of bottling carbonated beverages at this plant can best be described by referring to the diagram, Fig. 1. Simple syrup is made in the tank A. This tank is glass-lined and equipped with an electric agitator as well as a steam heating coil. The syrup is pumped through a cloth filter f into storage tank B, also glass-lined. In the diagram only one storage tank is indicated, but actually there are a number of such tanks for the storage and aging of the syrup. Here the flavors or concentrates are added to the sugar solution. During the actual bottling operation the syrup and added flavor is run into tank C, which serves as a reservoir for gravity feed to the bottling machines on the floor below. The pipes through which the syrup flows are made of block tin with ground joints and are constructed to be easily taken down for cleaning.

On the ground floor the empty bottles are placed on a conveyor which carries them into the bottle washer D. Here they receive successive washings with a hot solution containing caustic soda followed by several rinsings with fresh water. After being cleaned the bottles are conveyed, past an inspector, to the bottling machinery where, at E, the required amount of flavored syrup is delivered to each bottle successively. The bottles then pass to another nozzle, F, where they are filled with carbonated water and then crowned (G). A final visual inspection (H) by transmitted light is given each bottle after the crowning operation.

Water for carbonating is stored in a 650-gal. tank (1) which is equipped with refrigerating coils. In order to permit a high solubility of the carbon dioxide, the temperature of the water is maintained at just above freezing. The carbonator (3) is essentially a chamber into and through which the cold water runs as a thin film in an atmosphere of carbon dioxide. This gas is supplied by two tubes or cylinders at (2). The solution of carbon dioxide in water thus made is delivered into the bottles at station F, as previously described.

Laboratory supervision of the bottling department starts with a routine investigation of the water used for bottling. This water is from a deep well which has always been free from contamination. However, at certain seasons of the year a considerable amount of hydrogen sulphide appears. This amount may become so great that the water must be aerated before being used for bottling certain flavors. Otherwise these items must be discontinued until the hydrogen sulphide has disappeared. The weekly chemical analysis of the water can be depended upon to forecast this condition and make possible advance plans to cope with the condition. Daily routine bacterial counts on the refrigerated water stored in the tank previously mentioned have shown that in spite of the low temperature a considerable increase in number of bacteria will take place during storage. The number may become so high as to be a source of contamination in the finished beverage. As soon as the bacteria counts starts to show a marked increase, the tank is defrosted, drained, chlorinated, and refilled with fresh spring water.

Although the usual practices of plant sanitation are employed throughout, including thorough washing of pipe lines and tanks and sterilizing with live steam or chlorine, bacteria counts are taken of each batch of syrup and also of a sample bottle from each flavor bottled each day. Empty bottles coming from the washing machine are tested daily for sterility. These examinations serve as a check on the effectiveness of cleaning and sterilizing methods as well as affording complete assurance that no trouble will be encountered due to spoilage. Sample bottles from the production line also are examined as previously mentioned in the testing of sample bottlings of new flavors and concentrates.

IN THIS organization the technical laboratory functions in ways other than for the routine control of production. Many practical research problems of both major and minor importance are dealt with. These include such varied questions as:

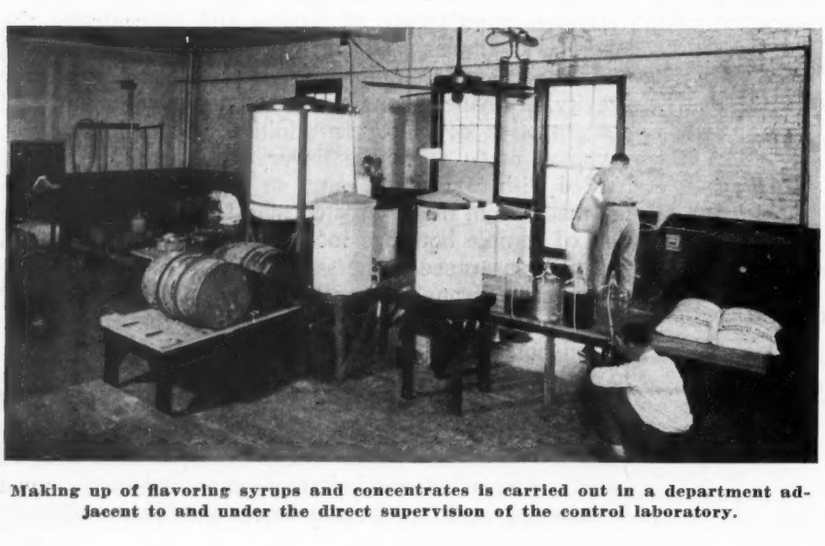
(a) What temperature and heating period cause a cooked taste in grapefruit juice?

(b) Is "A" sugar a good buy at 25 cents under the market price, or would money be saved by passing up this "bargain."

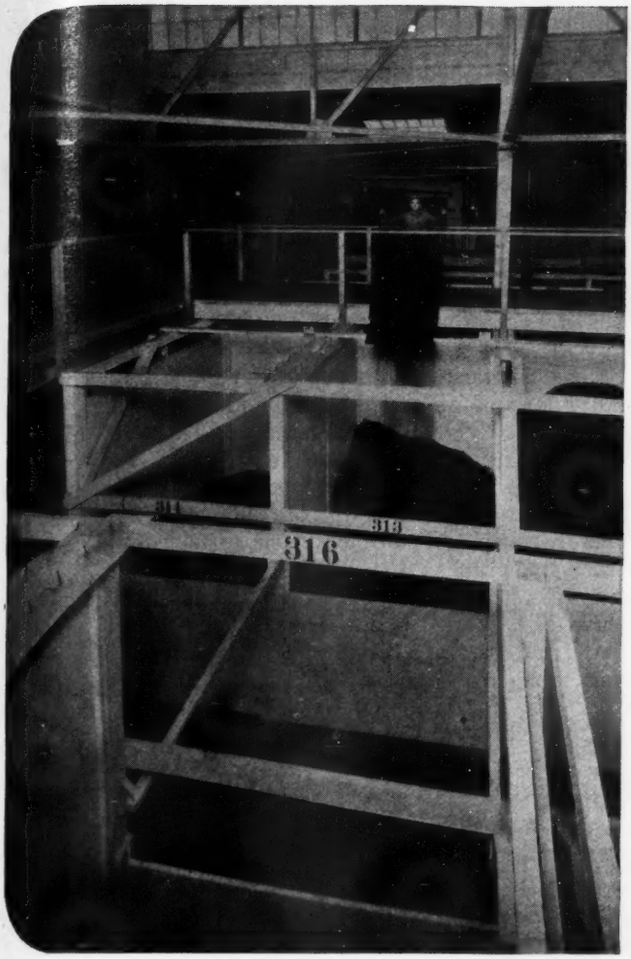
(c) Can true grapefruit juice be carbonated in a six-ounce bottle to retail for a nickel?

(d) Why is product coming through "flat," although the gages show plenty of gas pressure?

The company feels that it has failed to take full advantage of its laboratory and technical staff unless the work that the technical department is doing is not only known and appreciated by the sales department, but actually put to use. To this end occasional monthly sales meetings are turned over to the laboratory staff to conduct. At these meetings subjects relating to beverages are presented to the route salesmen and to subsidiary plant managers. Although the subjects treated are technical in character, the language used is simple, and "experiments" and illustrations are used to stimulate and retain the interest of these men who contact the buying public. This interest is in no small measure responsible for an aroused enthusiasm for and confidence in Celo products on the part of the sales department. Salesmen thus not only can talk intelligently about their products, but also can and do impart their enthusiasm to the dealers. In this way the laboratory becomes a distinctly valuable merchandising aid in the building of sales and profits.



Making up of flavoring syrups and concentrates is carried out in a department adjacent to and under the direct supervision of the control laboratory.



Bins for the storage of graded prunes, with grader showing at top, left. Note the numbering system on the bins, the overhead walkways for easy handling and the front-dump barrow.

Filling 25-lb. boxes of dried fruit. The operator at the right is placing a temporary form on the box to hold the loose fruit in position until after the pressing operation is completed.

Straight Line Packing

There is no loss of time or motion in moving dried fruit to, through and from this ten-acre plant on the West Coast

SHORT seasons can be made more productive by highly systematized materials handling, such as used at the dried-fruit packing plant of Rosenberg Brothers & Co., Oakland, Calif. As this firm sells in the world market, transportation facilities were a first consideration in plant location. Hence, the new plant has been located directly across the street from the Port of Oakland docks, so that packing is done practically at ship-side.

As the 25-lb. boxes of dried fruit leave the packing lines, they are loaded on trailers and hauled directly to the docks by electric storage-battery tractors, there to be loaded for shipment to foreign and domestic ports. Rail shipments are made in freight cars spotted on a siding located only a few feet from the ends of the packing lines inside the building.

Raw materials for this plant also are easily handled, as Oakland is readily accessible to the great central valleys of California, where most of the fruit handled is grown and dried.

Flow through this plant is in a straight line, fruit being unloaded at the inland side of the plant and leaving at the dock side. The plant is in two parallel sections, one for prunes, the other for cut fruits, including apricots, peaches and pears. The prune section has about five acres of floor area, the total plant area being roughly twice as much.

GRADING is the first step in packing the fruit. In the prune area, there are two grades, each 73 ft. long with eighteen hoppers. One is at each side of

the floor, with storage bins occupying the space between. There are 350 of these bins, each of 22 tons capacity. Graders are located on a mezzanine, level with the tops of the bins, and are fed from the floor below by elevator conveyors. During elevation, the prunes pass through a delumper, which breaks apart those that are stuck together. The prunes then pass through a winnowing channel where an air blast removes dust and foreign matter before delivery to the grader trays.

Grader trays are slightly inclined and are vigorously agitated. The prunes move from one tray to the next, until reaching a tray having perforations large enough to permit them to pass through. Thus, the grading begins with the smallest size, continuing through the various sizes packed, the largest passing off the end of the last tray.

Under the grader trays are hoppers which feed the prunes into barrows holding 600 lb. each. These are then wheeled to the correct bin, after weighing, and manually dumped. Bins are in rows, numbered consecutively, and are provided with movable board fronts which may be built up to the required height to accommodate the quantity of prunes in storage. Each runway over the bins serves two rows. The barrows are designed so that when tipped for dumping the front drops down to permit the contents to fall directly into the bin below. By weighing all fruit dumped into each bin, recording this weight by bins and also recording the weights removed for packing, a running inventory is kept of the quantity in storage.

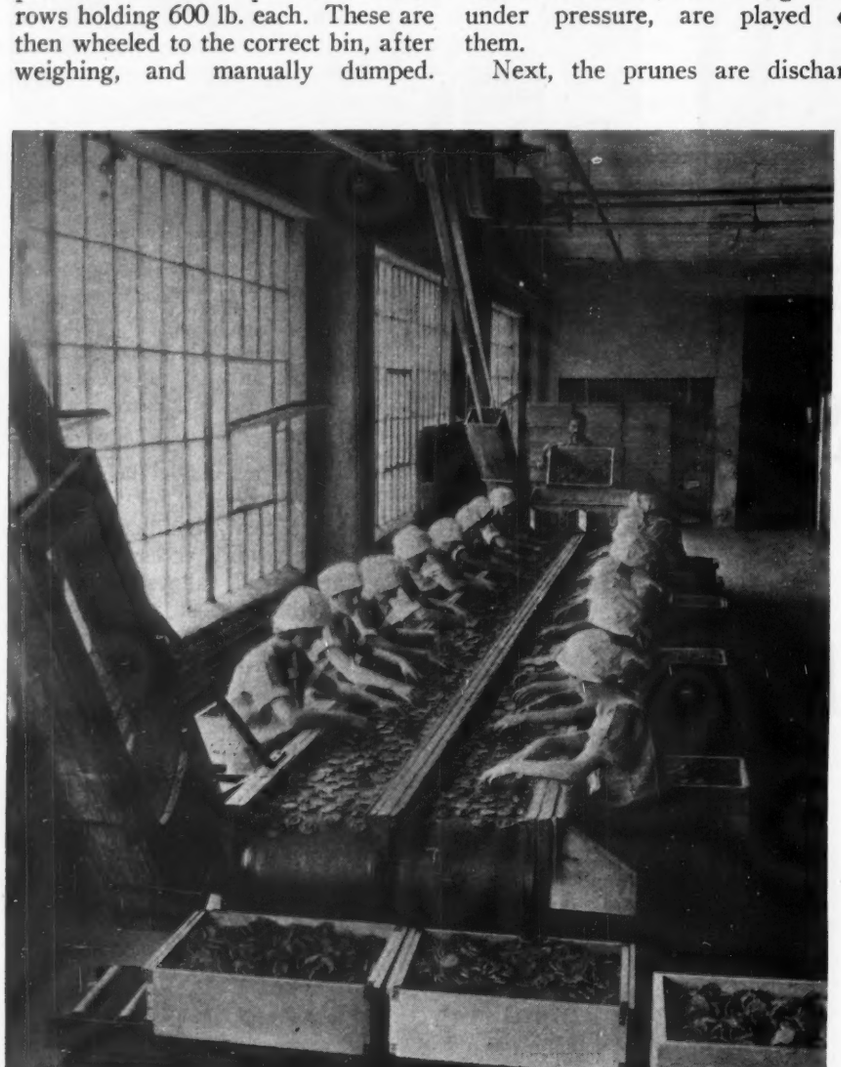
Prunes taken from storage for packing are moved by elevator conveyor to a rotary washer situated on the mezzanine. This washer is slightly inclined, so that the prunes move through it and pass to the baskets of another conveyor. While in these baskets, the fruit passes through the processing tank, where streams of water, at 212 deg. F. and under pressure, are played over them.

Next, the prunes are discharged from the basket conveyor to a white-rubber inspection belt. Women operators, stationed on each side of this belt, remove any prunes not suitable for the regular pack. From the end of this belt the prunes pass through a chute to two hoppers feeding the two packing lines.

Twenty-five-pound wooden boxes form the bulk of the pack at this plant, with some fibreboard cases, and tin containers for shipments to tropical countries. The boxes are lined with paper and move on a conveyor to position under the fillers. Here the operator fills each to weight by scale. After filling, the operator trips a foot lever, causing the filled box to pass along the conveyor and an empty one to take its place under the filler.

The unpressed fruit occupies more space than is available in a box, so a frame is placed over the box before filling, to extend the sides upward. Filled boxes, with this frame in place, pass along the conveyor to a press, a block being first placed on top of the fruit. The prunes, being still warm and soft, are in condition to be pressed, and the power of the press is applied gradually so that, at the time the box leaves the press, the top layer of fruit is even with the top of the box sides.

The blocks and frames are removed at this point and are returned to the filler on other conveyors. Filled boxes move on to the nailing machine. From this, export boxes go to a strapping machine, while boxes for domestic trade are removed from the conveyor. The finished boxes are loaded onto trailers, then drawn by electric tractors either to ships or freight cars.



Cut dried fruits, such as apricots, peaches and pears, are hand-sorted on conveyors which discharge into trays that go to a sulphur "house."

CUT fruit packing routine is, in general, similar to that described for prunes except that a cold wash replaces the use of hot water. Also, cut fruit does not go directly from inspection belt to fillers, but is discharged from the inspection belt into trays. These trays are stacked on trucks which are run into one of the 33 sulphur "houses." These compartments each hold one truck. When the truck is in place, sulphur in a pan is lighted and placed under it, and the compartment is closed. About four hours is required for sulphuring.

Wooden boxes for fruit packing are also made in this plant, in a box factory fully equipped with conveyors and automatic machinery.

Manufacture of colors for use in food processing is relatively a very small but highly developed industry. Also it is the one industry we know to be completely under government control and in which there are no trade secrets.

Certified Colors for Foods
Are Standardized Materials

By J. R. HALL
Chemist, Warner-Jenkinson Co.
St. Louis, Mo.

COLORS certified for use in foods are under the control of the Color Certification Laboratory of the Federal Food, Drug, and Insecticide Administration, Department of Agriculture. No batch of color is certified until a sample of the batch is sent to this laboratory in Washington, D. C., and analyzed. If the color conforms to the standards set up in Bulletin No. 1390, "Chemistry and Analysis of the Permitted Coal Tar Colors," a certification number is issued to the manufacturer for use on all packages of that lot of color. Accompanying this number is a statement of the per cent of pure dye in the color as is required by the regulations. The average percentage is about 90. The remainder is largely water of crystallization and salt.

All of the permitted colors have been proven to be physiologically harmless by exhaustive tests before being admitted to the permitted list. Other requirements to be met before a new color can be admitted are: proof of the need for the new color, full revelation of the methods of preparation so that the manufacture is free to all, and assurance that preparation of the dye or intermediates is not covered by patents or restricted in any other way. It is interesting to know that the United States is the only country which has recognized that the manufacture of food dyes is a specialized industry and that dyes manufactured for coloring textiles, candles, leather, paper, and the like, are not suited for use in foods. In fact, the stringent laws of the United States covering the specifications for food colors are regarded by some foreign observers as too severe.

At the present time there are fifteen permitted colors, Table I.

To designate the specific color referred to, these colors must be identified by some name other than the common name given them. It is the custom to refer either to the dye by the number given to it by Green in his translation of Schultz and Julius or by the number assigned to it by the Colour Index of the Society of Dyers and Colourists of England. Otherwise, Guinea Green B might be any dye that a manufacturer wanted to call by that name, while Guinea Green B No. 666 is a definite chemical compound. The dyes not followed by numbers have been introduced so recently that numbers have not been assigned to them.

THERE are a number of people who labor under the delusion that dyes of vegetable origin are purer and more desirable for coloring foods than are coal tar dyes. There has been no scientific evidence presented to support this data. It is no more difficult to purify synthetic indigo made in a dye factory than to purify natural indigo produced by cultivation of the indigo plant. The same holds for alizarin, the red dye of the madder plant, or for any of the other vegetable dyes. Both vegetable and coal tar dyes have to undergo definite processing in which they are purified and concentrated before they can be used in foods. Generally speaking, certified coal tar dyes are safer and more desirable than dyes extracted from vegetable materials and insects, such as cochineal. Also, vegetable colors may be sold without any guarantees regarding purity, strength, or correct methods of manufacture. Moreover, vegetable dyes, with a few notable exceptions, are quite fugitive in shade as compared to the certified colors.

Nothing can be considered perfect in this imperfect world, and certified colors are not exceptions to this general rule. It is likely that better colors than some of those now on the list could be discovered. The last four adopted colors: Fast Green F.C.F., Sunset Yellow F.C.F., Ponceau S.X., and Brilliant Blue F.C.F. were adopted to improve the coloring of certain foods that could not be adequately colored by the dyes on the list at the time.

Those who use colors must bear in mind that no dye exists which can be used for any and every purpose. That is why there are thousands of technical dyes. There are only fifteen certified food colors with which a food manufacturer has to work, but by using common sense and a little ingenuity the fifteen colors available can be made to take care of almost any need in a satisfactory manner.

The fifteen dyes given in Table I are termed Primary Food Colors. Secondary Colors are made by mixing together the various primary colors either with or without the addition of harmless and inert substances, such as salt or sugar. Secondary mixes can be certified in the same way as primary colors under the same regulations.

THE suitability of a blended color and the amount of it to be used for any specific purpose can be judged only by experimenting on the food product to be colored as most dyes are affected by acidity or alkalinity. A mixture which yields a brilliant orange in a beverage may produce a reddish cake or ice cream. It is also necessary to be accurate when measuring out the quantity of a blended color. A mixture of Orange I and Tartrazine may yield a perfect cream shade when used correctly, but if too much color is used the finished product may turn out too red. If too little color is used, there may be a greenish-yellow cast to the finished goods.

Certified food colors will retain

their properties and strength indefinitely if kept in a dark air-tight package. Otherwise moisture may be absorbed from the air, with the result that the dyes will increase in weight and a corresponding decrease in color strength will occur. Colors stored for long periods in the tin cans in which they are often sold, with lids that are not tight, may acquire comparatively large amounts of tin and iron from the rusting of the metal, due to the high moisture content of the dye.

The quantity of dry color needed in food products is quite small, consequently it is customary to prepare the dry colors into either the paste form for such uses as in hard candies or into solution form so that soft candies, icings, syrups, and beverages may be easily and accurately colored. Whenever a small amount of water can be safely introduced into the batch it is better to use color solutions, because they can be prepared and measured out more accurately. However, liquid colors or pastes should not be regarded as stable or permanent preparations. Aqueous solutions of the certified colors are good media for the growth of yeasts, molds, and bacteria, consequently improperly prepared color solutions may lead to spoilage of the finished goods, particularly beverages or ice cream.

Food colors are quite sensitive to the presence of small amounts of metals in a solution, and care must be taken in choosing vessels and equipment that come into contact with them. Glass or glass enameled equipment are best, for they can be maintained easily in a sanitary condition and are without effect on the color solution. Wood is probably the next best material, although it is somewhat difficult to keep wooden equipment clean and sanitary. Of the metals, stainless steel and monel metal are to be preferred. Tin or zinc vessels are to be avoided at all costs.

TO PREPARE small batches of liquid color, the correct amount of dry color should be weighed out on an accurate scale, and placed in an enameled or glass vessel. It should then be made into a paste with a small amount of water using a glass rod or enameled spoon, making sure that all of the color particles are wetted. The balance of the water needed, previously heated to 180 deg. F. should be added and the whole stirred until solution is complete. Solution should be filtered. Distilled water should be used if available. Large batches are made by running dye into 180 deg. F. water while stirring vigorously. The dissolving vessel should have a cover and an agitator and the color run in through a dry wide funnel.

A freshly made color solution is probably practically sterile, but it will not remain so long unless protected against micro-organisms. Ten per cent of alcohol by volume makes a satisfactory preservative and is enough to keep the solution in good shape. However, even this small quantity of alcohol decreases the solubility of all of the food colors. The formulas used must be adjusted to take care of this factor.

Glycerine makes a good preservative if used in comparatively large quantities; 50 per cent solution for long periods and 25 per cent for short periods. Another method of preparing color solutions has been suggested in which 1 or 2 oz. of citric or tartaric acid crystals are used per gallon of color solution. Bacteria and yeast will not grow in acid media, although they may remain in a spore state, but molds are likely to grow, due to their ability to survive in media which are quite acid. Color solutions containing 1 oz. of tartaric acid crystals and ¼ oz. of sodium benzoate per gallon have kept for over a year in our laboratory. The amount of benzoate introduced into a beverage by this means is quite small —less than one part in 450,000. The use of sodium benzoate alone in a neutral solution exerts very little preservative action.

The strength of all color solutions must be determined according to the solubility of the color and the temperature to which it will be exposed. The approximate solubility of some of the principal colors are found in Table I. It is a good plan to make as concentrated solutions as possible, which can be diluted later. Factory errors in measuring out quantities of color can be eliminated by arranging the strength of the solutions, so that even amounts of color are used in each batch. Also, it is convenient to prepare color solutions of such a strength that 1 oz. will color 1 gal. of bottling or fountain syrups which is to be subsequently diluted to 6 gal. with water in the making of the finished beverage, Table II.

Certified dyes being carbon compounds are easily destructible. Some of the agencies which may effect food colors are—

Ultra-violet rays (from strong sunshine)
High temperatures
Oxidizing substances (air, bleaching agents)
Reducing substances (action of tin, other metals or hydrosulfites)
Hydrolyzing agents (acids, alkalies)
Micro-organisms (yeast, molds and bacteria)

In an early future issue of FOOD INDUSTRIES, *Mr. Hall will have an article devoted to the use of certified food colors and some highly practical observations concerning their virtues and shortcomings which will be helpful to all food manufacturers who use colors.*—EDITOR.

Table I—Permitted Coal Tar Food Colors

Water Soluble		Year Approved	Color Index No.	Schultz-Julius-Green No.	Solubilities: Oz. per gal. Water 34°F.	Oz. per gal. Water 70°F.	Oz. per Water +10% Alcohol 70°F.
Blues	Brilliant Blue F.C.F.	1929	*	*	*	25	25
	Indigo Sodium Disulfonate	1907	180	692	..	2-4 est.	..
Greens	Fast Green F.C.F.	1927	*	*	*	23	18
	Guinea Green B.	1922	666	433	..	..	..
	Light Green S.F. Yellowish	1907	670	435	..	40 est.	..
Orange	Orange I.	1907	150	85	3	4½	4½
Reds	Amaranth	1907	184	107	12	18	9½
	Erythrosine	1907	773	517	..	13 to 16 est.	..
	Ponceau 3R.	1907	80	56	8	15	8
	Ponceau SX.	1929	*	*	4	9½	5
Yellows	Naphthol Yellow S.	1907	10	4	..	..	..
	Sunset Yellow F.C.F.	1929	*	*	12	23	8½
	Tartrazine	1916	640	94	5	17½	12
Oil Soluble							
	Yellow A.B.	1918	22	*	..	..	..
	Yellow O.B.	1918	61	*	..	..	..

* Have not yet been designated.

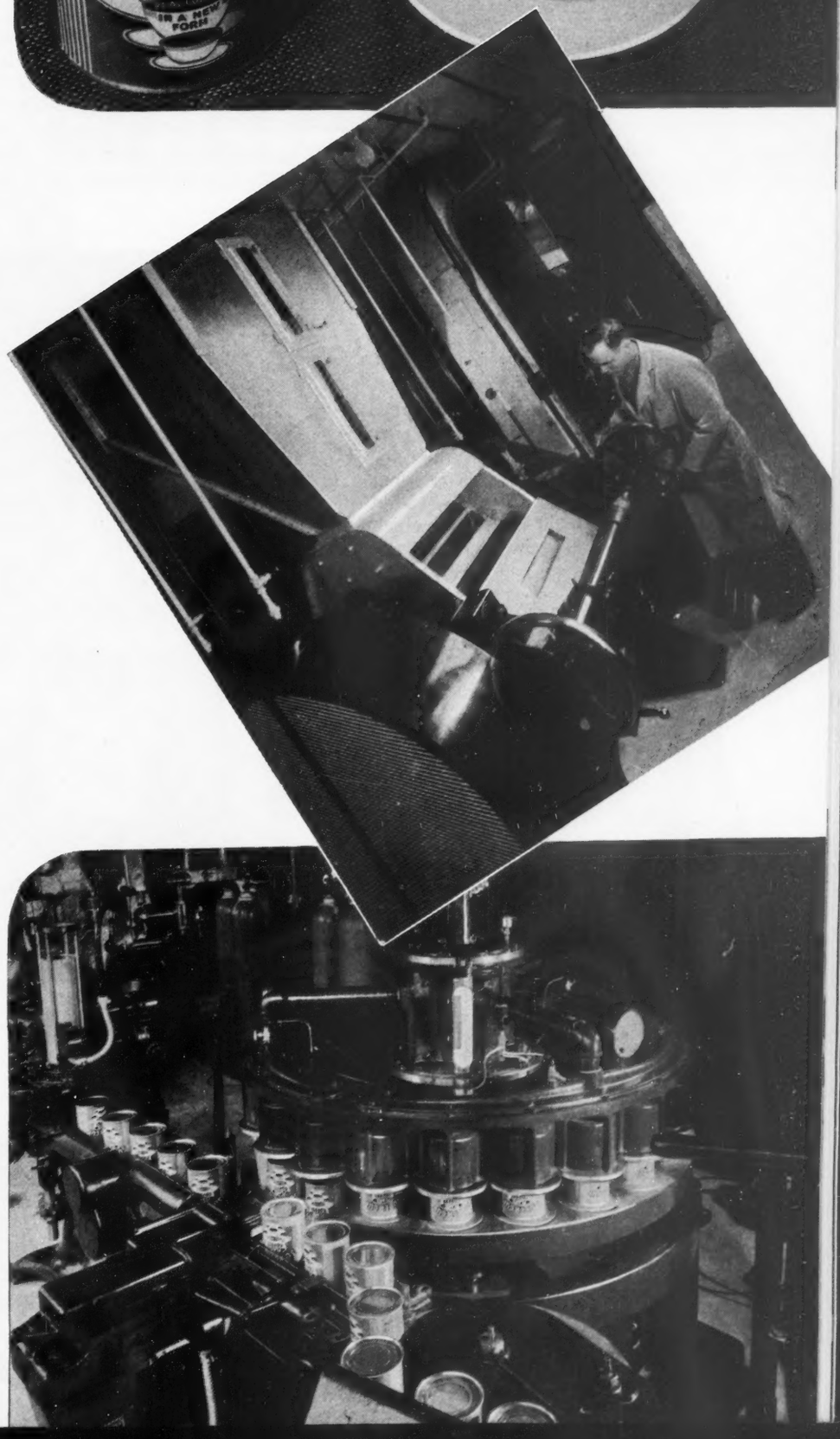
Table II—Weight of Color[1] Used Per Gallon of Solution[3]

Blue	2 oz.
Browns	8 oz.
Cream Yellows (Bakery Goods and Ice Cream)	2 oz.
Erythrosine (Candy)[2]	2 to 3 oz.
Green Shades	3 oz.
Orange Shades[2]	4 to 6 oz.
Purples[2]	5 to 6 oz.
Red Shades except erythrosine[2]	6 to 7 oz.
Yellow Shades[2]	2 to 3 oz.

[1]If the 100 per cent strength colors (85 to 90 per cent dye) are not used weights specified must be increased in proportion.
[2]To allow for variations in shade desired and for variations in secondary color mixes made by different manufacturers.
[3]One ounce of solution sufficient for 50 lb. batches or for 1 gal. of bottlers or fountain syrup to be diluted to 6 gal. with water in beverage mix.

FOOD PACKAGES and PRODUCTS

New



Coffee in Flake Form. Coffee in an important new form—small, paper-thin flakes—has been introduced in the Glens Falls, N. Y., sales territory by Grand Union Co. This marks the first commercial distribution of a product developed through six years of research by Continental Can Co. (FOOD INDUSTRIES, May, 1934).

Flaked coffee is made by passing ground coffee between highly-polished rolls under a pressure of 10,000 lb. per sq.in., the product first being rendered "plastic" by tempering to the right degree of moisture content. After flaking, the coffee is automatically weighed and filled into cans which go first to a clinching machine that loosely secures the tops. The next unit pulls a vacuum on the containers to remove the air and then charges the cans with carbon dioxide to preserve the coffee. The last operation is sealing the cans tightly. The whole cycle requires eight minutes per 100 lb. The process not only is continuous but is under automatic control at every point; the plant occupies a space about 15x45 ft. In the illustrations are shown the flaking machine (center) and the vacuumizing and gassifying unit.

In the flaking process, the carbon dioxide is said to be expressed from the coffee without carrying away the flavor and aroma as it does when it escapes over a period of time in a package. The gradual building up of pressure in the can also is eliminated.

Flaking also makes possible rapid and uniform extraction. Since the rolls flatten the particles to a thinness of 0.006 in. and break down the cellular structure, the coffee gives up its essence and flavor almost immedi-

ately. It is possible to prepare a cup of coffee by pouring hot water over a spoonful of flakes placed in a tea strainer, and cool tap water may be used in making iced coffee. Quick brewing also is obtained in percolators, dripolators and boiling pots.

The "Super Cup" coffee is being sold in 10-oz. cans at a present price of 20 cents. Ten ounces of the flaked coffee is said to make as many cups as a pound of the percolator ground product.

Egg Nog in Bottles. Egg Nog in bottles labeled "Reevatone," "a real palatable body builder," is being distributed by Rivas & Co., Inc., New York. Made from fresh egg yolk, grade A milk, cognac and sugar, the product contains 15 per cent alcohol and 40 per cent solids.

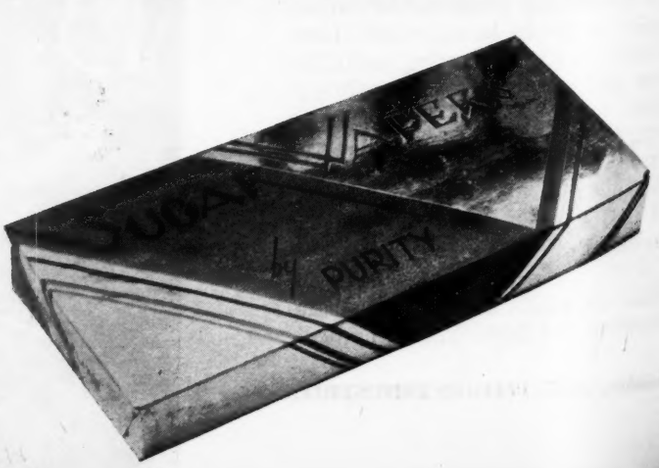
Marketed as a food and not a liquor, Reevatone not only can be taken straight or with milk, but is intended for use as a sauce or flavoring with other foods.

The egg nog is attractively packaged, its yellow color being contrasted with a red and black label and a red, lacquered cellulose capsule covering the neck and cap. Enhancing the appearance is a wrap of yellow-tinted transparent cellulose which is twisted about the neck of the bottle and which holds in place a recipe book on the back of the package. A metal screw cap closes the container. Reevatone is marketed in 2-oz., 6-oz., 9-oz. and 12.8 oz. sizes.

A Good Package. Several factors of successful packaging have been incorporated in the container for the "Gold Label" preserves of Thorne & Olds, Inc., Chicago. Not only is this package unusually attractive, but it displays the product to advantage, has the appearance of size, combines brand and product identification and affords consumer convenience through a wide mouth and a reclosing pry-off cap. And what is quite important, the package is free from fancy frills which interfere with production-line operations. As may be seen in the illustration, attractiveness is attained through the pleasing shape of the jar, a ribbed design in the glass, the neat label, the smooth cap and the display of the contents.

Metal-Wrapped Biscuits. To protect its sugar wafers against moisture, Purity Biscuit Co., Salt Lake City, Utah, is wrapping the light cardboard carton in which they are packed in a heat-sealing, paper-backed metal foil. Of modern design, and printed in green and black on silver, the wrapper also gives the package considerable eye appeal.

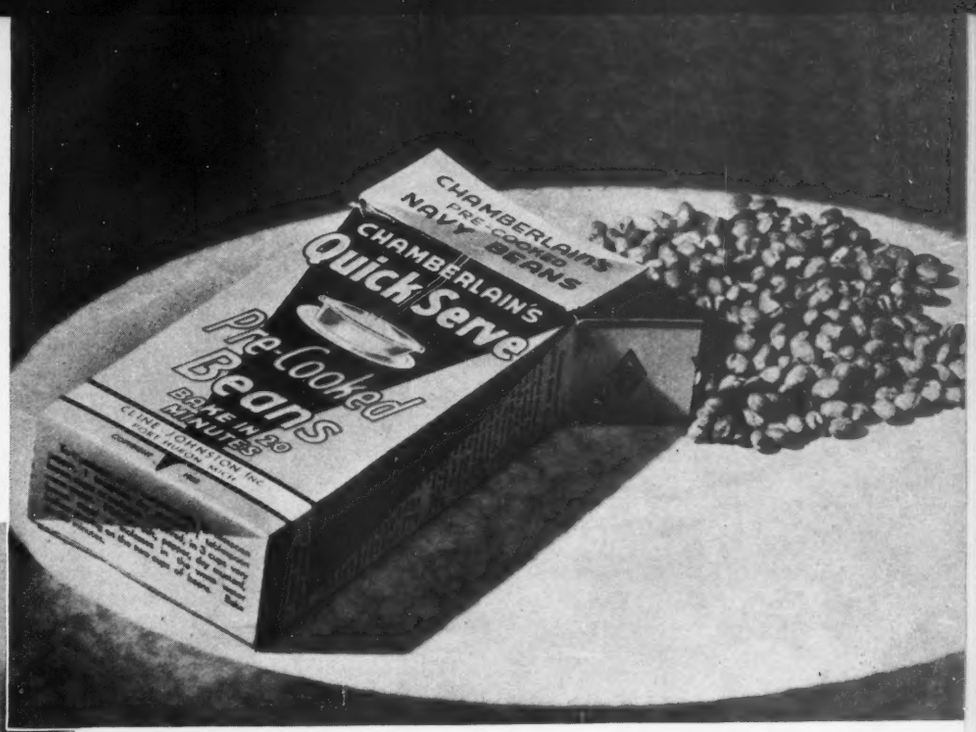
In laboratory tests in which the relative humidity was kept at 95 to 100 per cent, the temperature at 100 deg. F. for four days, the metal-wrapped package is said to have shown a moisture absorption of 0.64



PRODUCTS

per cent as against 8.81 per cent for a package of the type formerly used.

Two Tumbler Packages. Two of the latest recruits to the army of foods put up in glass tumblers are the "Good Luck" salad dressing of J. F. Jelke Co., Chicago, and "Nalley's" sandwich spread of Nalley's, Inc.,



Tacoma, Wash. Both products are effectively displayed in the premium containers to give a double sales appeal. For repeat sales, the manufacturers depend upon the quality of the products aided by the consumers' desire to acquire and maintain a complete set of the tumblers.

Striking Can Labels. Extra large vignettes of the product, done in bright colors on a black background which heightens the effect, create a strong appetite appeal in the label design adopted by Merchants Service Corp., Chicago. Used with the "Moon Rose" brand, the trade name for a complete line of top-grade products, the new design was created with the actual product as the model.

Twenty-Minute Beans. Another burden has been taken off the housewife. This time not by a food put up in cans nor by a prepared mixture,

but by a precooked product. Beans, the food that requires hours of soaking, parboiling and baking before tender enough to eat, are now marketed in a condition which permits baking in twenty minutes. Known as Chamberlain's "Quick Serve" precooked beans, the new product is put out by Cline & Johnston, Inc., Port Huron, Mich. This company cooks the beans and then dehydrates them under a patented process.

Put up in cardboard cartons, the beans retail at 10 cents for 10 oz., a price which the distributor maintains means nothing alongside the estimated 12 to 15 cents spent for fuel to prepare a batch of baked beans from the raw. The beans also are usable in making soup and other dishes, and are credited with being easily digested.

New Bag Boosts Sales. Potato chip sales increased 26 per cent for Mrs. Drenk's Food Products Co., Milwaukee, after the company adopted a more effective package. The colorful, clean-cut appearance of the new design is evident in the illustration. This enhanced appearance influences more retailers to give the chips a preferred display position and at the same time catches the attention of more buyers.

A small but important part of the new design is the solid red panel at the bottom. In addition to identifying the product when the bags are stacked flat on the counter, this panel shields from visibility any small broken bits of chips which settle to the bottom.

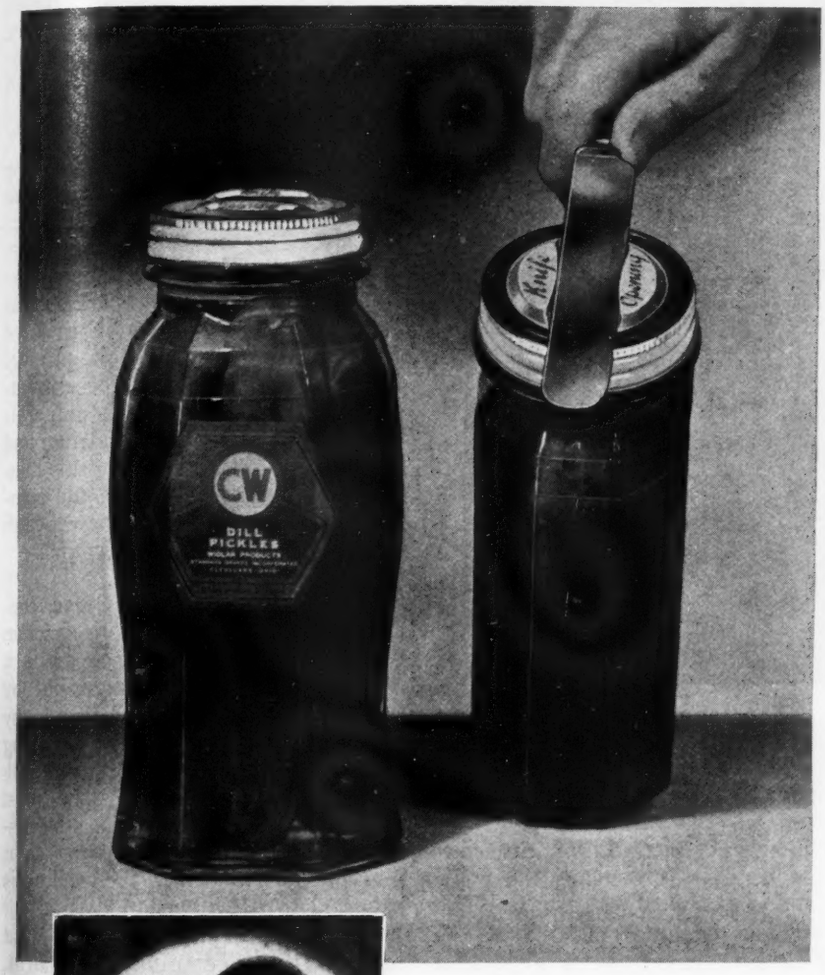
Much of the striking appearance of the design is due to its being printed on the glassine before the material is waxed.

Tight Bag for Nuts. "Tas-T-Nuts" have been reaching consumers in better condition during the hot summer months, according to Tas-T-Nut Co., Baltimore, Md. Two important factors combine to accomplish this. First, the fancy nuts are sterilized in the plant to prevent germination. Secondly, the product is packaged in a new tightly-sealed, transparent cellulose bag which prevents moisture absorption by the salt and keeps the nuts crisp and fresh for a greater length of time.

To facilitate handling, the company uses a bag on which the label elements are printed, rather than one with a label over the top. The white printing, done in a sunburst design, gives the nuts a fresh appearance, too.

Dog Food Modernized. "The original canned dog food," "Ken-L-Ration," now appears under a new label. In fact, the entire line of Chappel Bros., Inc., Rockford, Ill., has been or is being redesigned, the idea being to give it better shelf appeal.

PACKAGES and PRODUCTS



Apparently, the purpose is being realized, because the company reports a decided pick up in sales in stores in which the new label has been placed.

The new design, as seen in the illustration, is based upon two diagonal bands of color, with the image of Rin Tin Tin on the upper band and the brand name on the lower. The two bands give a pleasing color contrast, the top one being in buff and the lower in a deep red. As applied to cans, the diagonal design is unusual, yet is simple.

In addition to Ken-L-Ration, containers for "Maro-Meat" and "Ken-L-Biskit" have been changed, the former being in cans and the latter in cartons. And three types of dog biscuits formerly selling under different names have been combined under "Ken-L-Biskit," descriptive information in a circle on the lower color band identifying the different types.

Compared with the former designs, which were in bright colors and contained many elements, the simple, richly colored labels and cartons now used connote a more expensive and higher quality product.

Coconut Syrup. Something new in syrups recently made its appearance in an attractive glass container under the label of J. R. Hines & Co., Hogansville, Ga. It is a coconut-flavored syrup made from cane sugar and corn products. Packed in a 15-oz., wide-mouthed jar with a metal screw-cap, the product has been quite successful, Hines reports.

Knife-Opening Pickles. For its first line of pickles, the "C.W." brand, Widlar Products is using an attractively shaped, eight-sided glass jar with a wide mouth topped by a knife-opening cap. This newly designed jar of Standard Brands' Cleveland division has practical reuse for home packing. As to the closure, the company feels that it is "the most sensible cap that has ever been brought out for these jars." It is considered an extra sales producer.

Potato Crisps in Tin. A new idea in preserving deep-fried potato products is being employed by Tatoe Crisps, Inc., Hudson, N. Y. This company has brought out crispy potatoes in "shoe-string" form and is packing them under vacuum in tin cans to prevent them from becoming rancid or losing their crispness.

The can makes an effective package. It is lithographed in blue on a light background, with an illustration of the product appearing on the front panel in yellow and brown. The back panel carries suggested uses. Three ounces is packed in each tin.

Soy Bean Beer Improver. Under the name of "Pro-zyme Flakes," Archer-Daniels-Midland Co., Chicago, has introduced a soy bean product for brewers. Intended to replace a like amount of malt, the soy bean flakes are added to the beer at the rate of approximately three fourths of a pound to the barrel. They are added directly to the main or malt

mash along with the malt, and are carried through the peptonizing and diastatic steps.

The purpose of the flakes is to provide a creamy, stable "head" of foam on the beer. And by virtue of their enzyme activity, they are said to increase substantially the extract yield from malts. The flakes have an oil content of less than 1 per cent, which compares with the oil content of brewers' corn flakes and grits.

Distinctive Tumblers. Many food manufacturers are packaging such products as salad dressing and mustard in glass tumblers, but few distinguish the containers with labels as strikingly different as those adopted by Shefford Cheese Co., Syracuse, N. Y. The Shefford labels, used on glasses containing "Old English" mustard and "Balanced Flavor" salad dressing, not only are printed in an unusual type but give the impression of being hand-lettered, or custom-built. The packages for the two products are alike, suggesting twin sales to the housewife who wants to acquire a set of the tumblers. Each container carries 8 oz.

Baby Food in Glass. A complete line of strained foods packed in glass has been introduced by Beech-Nut Packing Co., Canajoharie, N. Y. Comprising cereals, fruits and vegetables, the products are intended for

infants and people requiring a special diet. The cereals are cooked long enough to insure thorough starch conversion.

Glass was selected for the container because it displays the color and consistency of the food. The cover is of the tamper-proof type, being held in place by an aluminum capsule. On the underside of the cap is a coating of baked-on enamel to prevent contact of food with metal. The cover can be snapped on the container for reclosing. The packages are of two sizes, 4 oz. and 14 oz.

Powdered Whey Foods. Two new health foods have been prepared from whey by Milk Minerals Co., Inc., Chicago. This company recently discovered means of producing powdered whey, which is marketed as "Wheytone." The research that led to the manufacture of this product also perfected a method for extracting and concentrating milk minerals found in whey, especially calcium and phosphorus. And by adding this mineral fraction to Wheytone, the company produces a second new health food which it calls "Lacticam."

High-Calcium Bread. Bread containing 800 per cent more calcium than ordinary milk-free bread is a new health product brought out by Omar Bakery, Omaha. The company promotes the product as a "wedding of wheat flour and 12 per cent of milk solids" which results in "the most nearly perfect food." The advertising also features the following eight ingredients with which the calcium is balanced to provide a food good for teeth, hair, sparkling eyes and what have you: carbohydrates, phosphorus, manganese, protein, iron, vegetable fats, vitamin A and vitamin B.

Packing and Shipping Frozen Vegetables

IN THE Northwest frozen shelled peas for institutional markets are being generally packed dry in No. 10 tins, in clip or friction cover cans up to 10-lb. capacity, or in paper tubs holding about 5 lb. Lately an effort has been made to use vegetable parchment bags or wraps forming brick-shaped packages with the object of cutting packing costs.

Corn, both on and off the cob, is generally packed in No. 10 tins or gallon paper tubs. On the cob, it is also packed in vegetable parchment wraps with twisted ends. Sometimes two or three dozen ears, wrapped in vegetable parchment, are packed in corrugated paper cartons which are left open during freezing at 0 to 10 deg. F., then closed and stored at 0 deg. F.

Dry-packed frozen corn and shelled peas are shipped from the Northwest during the winter months in tightly loaded cars refrigerated with ice and 15 to 25 per cent salt. Some shippers lower storage temperature from 0 deg. F. to —10 deg. F. just prior to shipping to get a "reserve of refrigeration" in the contents of the cars. When so shipped and held at 10 deg. F. until ready for distribution these frozen vegetables carry well. Important factors in processing these vegetables are the proper maturity of the vegetables when gathered and the rapidity with which they are handled, especially between the husking or shelling and the scalding to inactivate the enzymes.

Among the latest developments is the freezing of peas on wire trays or belts at temperatures of about 0 deg. F. At this temperature, the vegetable freezes quite solidly in from twenty minutes to two hours and the individual peas are already separated or can be broken apart quite readily when in this frozen condition.

The buying trade has shown a preference for "single-frozen" peas, as they can be packed in this hard marble-like state in containers from which they will readily pour as desired by the user. The Northwest is packing a goodly proportion of its output in this manner.

Cocoa Shipping in Paper Bags

Rockwood & Co. find open-mouth multi-wall kraft paper bags satisfactory for local truck deliveries and for carload shipments requiring no handling or transfer enroute. Cost much below usual type of shipping containers.

By BENJAMIN J. ZENLEA
Chief Chemist, Rockwood & Co., Brooklyn, N. Y.

ADOPTION of multi-wall kraft paper bags for bulk shipments of cocoa powder by Rockwood & Co. more than a year ago was in the nature of an experiment.

For years bulk cocoa powder has been shipped in wooden barrels or in wooden or fiber drums. More recently burlap bags with paper inner liners have been tried, but with varying success. Extreme care has to be taken to prevent lint and fibers from the bags getting into the cocoa or mix upon emptying. This disadvantage can be minimized by emptying the cocoa onto a screen which will retain the lint and fibers. Cocoa packed in 100-lb., tear-resisting bags is comparatively easy to handle and convenient for incorporating into batch mixes.

Cutting of container cost as well as shipping expense and facilitating ease of handling are reasons why Rockwood & Co. is using the multi-wall paper bag. Slack-coopered wooden barrels with safety bag liners represent an expense of approximately 75 cents and a tare weight of 25 to 26 lb.; 100-lb. fiber drums run about 70 cents each and a tare weight of 10 lb.; burlap bags with liner cost about 15 cents and weigh in the neighborhood of 5 lb.; multi-wall paper bags are bought for about 8 cents a piece and have a tare weight of only 3½ lb. Their net weight of contents is 100 lb., as is that of the most convenient size drum. Burlap bags carry 140 lb. Barrels run from 180 to 200 lb. net weight, depending upon the fat content of the cocoa and its fineness.

During the year multi-wall paper bags were tried out in shipments

Closed bags may be handled by two-wheeled trucks, the same as burlap bags or similar shipping containers.

ranging from daily truck shipments for local customers to carload shipments by rail and/or water. Water shipments included transfer by canal, barge and steamship. Study of these shipments showed that attention had to be given to the method of handling the filled bags between the plant and the local shipping terminals. When the bags were once loaded into the final shipping carrier there was practically no damaging or bursting of the bags.

Because of the ease and compactness with which these 100-lb. bags of cocoa can be loaded or stored there is also a considerable saving in space requirements for them. Their overall tube-size dimensions are 22x3½x44 in. and they may be stacked as many as ten high, depending of course upon the load tolerance of the floors in the stacking area.

In this instance the open-mouth-type bag is used with a specially designed machine unit to close them after filling by sewing the closure with a tear-resisting cushion stitch and binding the end and covering the seam with a strong kraft paper edging.

DURING these tests four-ply bags have been tried using all plies of 40-lb. basis weight stock; two layers of 40-lb. and two layers of 50-lb. paper; and three layers of 40-lb. and one layer of 50-lb. paper stock. Shipments going to distant points fared best with the heaviest bags, while local deliveries were made quite satisfactorily in bags of the lightest construction. Bags made with two plies of 40-lb. and two plies of 50-lb. paper give most satisfactory general service and have been adopted for all shipments.

In the Rockwood plant the bags were filled in the manner commonly used by the cocoa department operators to fill barrels or drums and taken by two-wheeled trucks to another area, where they are run through the sewing and binding machine to give them virtually a dust-proof closure. By wheel truck or floor-level conveyor belt the filled and sealed bags are delivered to shipping platform or to storage. Increased care to prevent breaking of bags has been found necessary during the cold months of the winter.

To what extent this type shipping container can be adopted for dry, free-flowing foods or food materials is problematic; also there may be considerable difference of opinion as to the relative virtues of the closed or open-end types of bag construction. However, Rockwood & Co. after more than a year of trial period continues to use the open-end style for its cocoa.

Size and shape of bags encourage stacking to get maximum use of available storage space. Floor-level conveyors take bags to shipping department or storage.

PROMOTING *the Product . . .*

▶ CAMPBELL SOUP CO., Camden, N. J., is using full-page newspaper ads in four western cities in a test campaign to determine possibilities of making people in inland cities more clam chowder conscious.

▶ GENERAL FOODS CORP., New York, went back on the air Oct. 3 with "Maxwell House Show Boat," featuring Lanny Ross. In its fourth year, the program is broadcast over an NBC-WEAF network.

▶ H. J. HEINZ CO., Pittsburgh, has introduced a series of radio programs featuring Josephine Gibson, adviser on food problems. It is a Monday, Wedensday and Friday morning broadcast over a Columbia coast-to-coast hook-up.

▶ SCHLITZ BREWING CO., Milwaukee, will distribute beer in "cap sealed" cans, but will not discontinue the use of bottles. Newspapers will be used to introduce the cans.

▶ CALIFORNIA vintners have adopted a program for promoting wines. It includes obtaining the cooperation of California hotel men, obtaining Federal quality standards, cutting in half the federal taxes, and making nation-wide efforts to obtain "fair" taxation and regulation in individual states.

▶ COCA-COLA CO., Atlanta, Ga., is sponsoring Ray Noble and his orchestra in a half-hour program over a nation-wide WABC-Columbia network on Wednesday nights.

▶ ASSOCIATED SALMON PACKERS, Seattle, soon will conduct a national advertising campaign, and it has sent out direct-mail literature soliciting the advice of brokers, jobbers and retailers as to the scope and nature of the campaign.

▶ BORDEN CO., New York, has launched a campaign on Chateau cheese in fifteen newspapers in eight cities and is using spot radio programs in sixteen cities. The cheese is promoted as a cooking ingredient.

▶ BORDEN'S FARM PRODUCTS CO., INC., New York, is sponsoring a Saturday evening broadcast over WOR to promote milk. The program includes football talks and a high school amateur show.

▶ NATIONAL ASSOCIATION OF COUNTER FREEZER MANUFACTURERS, Chicago, will conduct an advertising campaign in drug-trade publications and by direct mail.

Two dates appear on the new egg packages of Dated Egg Corp., New York. One indicates when the eggs are packed, the other the time after which they are not to be purchased. Furthermore, each carton is sealed with the stamp of a government grader. To introduce these dated eggs, the company gives free with the first carton purchased a complimentary two-egg sample. If the sample proves unsatisfactory, the large carton may be returned unopened. The eggs are packaged in cartons overwrapped in moistureproof transparent cellulose to prevent shrinkage and delay spoilage.

▶ KELLOGG CO., Battle Creek, Mich., put Ruth Etting and Red Nichols' orchestra on the air Oct. 25, this being a Friday-evening, half-hour program over an NBC-WJZ network.

▶ SWIFT & CO., Chicago, recently issued a booklet on the production of potato chips with "Vream."

▶ MILK FOUNDATION, INC., Chicago, inaugurated on Oct. 6 a radio program over WBBM with a series of talks entitled "Stars of the Milky Way."

▶ NEW YORK STATE'S bureau of milk publicity has set out to convince business men that milk gives them "a superabundance of physical force," using a Jack Dempsey testimonial in newspaper advertising.

▶ MONROE, WIS., "The Swiss cheese capital," celebrated Cheese Day on Oct. 2, with 50,000 people at the festivities. These celebrations are held once every five years.

▶ WISCONSIN now has a $50,000 annual appropriation for advertising its dairy products, a bill to that effect having been approved by the governor.

▶ BLATZ BREWING CO., Independent Milwaukee Brewery and Manhattan Bottling Co., all of Milwaukee, recently backed an amateur six-day bicycle race which attracted more than 30,000 people. A similar event, but on a bigger scale, is planned for next year.

▶ NATIONAL CANNERS' ASSOCIATION, Washington, D. C., has issued folders on canned peas and tomatoes which give brief histories of the vegetables, describe how they are grown and processed, and discuss their nutritive values.

▶ MOORES & ROSS, Columbus, Ohio, recently gave cash prizes totaling $500 for the best 100 words on "What I have learned about 'Badge of Merit' milk."

▶ LARSEN CO., Green Bay, Wis., will distribute nationally its mixed vegetable product, "Veg-All." A full-page color ad in a national women's magazine launches the promotional campaign, the ad bearing a coupon entitling anyone presenting it to a grocer handling Veg-All to a can of the product.

▶ DOUGHNUT CORP. OF AMERICA will construct a $75,000 doughnut and coffee shop on the Texas Centennial Exposition ground at Dallas. The company is said to have sold 60,000,000 doughnuts at A Century of Progress.

New set-up under Interstate Commerce Commission will regulate all interstate trucking

Bureau of Motor Carriers

FOR-HIRE truck rates, whether on a common carrier or contract basis, will inevitably increase with federal regulation of interstate operations under the Motor Carrier Act that nominally went into effect Oct. 1. Even though truckers establish their rates on cost of service, rather than on what the traffic will bear, regulation entails an increase in costs that will be reflected in rates and charges.

By past experience, many food firms have satisfied themselves that it is cheaper to use the services of for-hire carriers than to operate their own truck fleets. All of the large processing and distributing companies and many of the smaller ones ship their goods across state lines in the vehicles of common carrier or contract operators that now are subject to regulation by the Interstate Commerce Commission, in addition to regulation previously established by the states. For that reason, shippers using for-hire trucks should, when federal regulation becomes effective, appraise again the comparative cost of using for-hire services as against the cost of owning and operating their own trucks.

That shippers will be prompted to check up on the effect that the new law will have upon their trucking costs explains why costs of service will surely prevail over adoption of a rail basis of rates, although there is a wide divergence of views on this issue among for-hire truckers at present. Cost, however, is an elusive factor. Out-of-pocket expense is much less than full cost, so before deciding in favor of trucking their own freight, shippers must be sure that they have included all elements.

IN GENERAL, the cost of for-hire truck transportation will be higher in future, if only because truck operation will tend, under regulation, to become a stable system of transportation. The NRA trucking code was the first step in this direction. In-and-out operators that by their sporadic competition have forced truck rates down here, there and everywhere, to less than cost at some time or other have frequently demoralized the operations of responsible operators. The wildcat will eventually disappear from the highways as, individually, their operations are short-lived and the new flock that continually springs up will have to qualify in future as "fit, willing and able to perform the service of a contract carrier" and to conform to the provisions of the new law and I.C.C. regulations. Thus, the truck transportation field will be fully covered eventually by operators desiring to do a continuing business at a fair profit.

There are particular factors that will tend to raise truck transportation rates. Both common and contract operators must carry such insurance or other protection for the public as may be required by the commission and, in addition, common carriers must furnish similar provision for the compensation of shippers for loss and damage to freight.

Of prime importance in trucking costs and operations of both for-hire carriers and private owners is the authority vested in the commission to prescribe safety requirements, including qualifications and maximum hours of service of employees, and standards of equipment.

THE language of the law with respect to *private carriers* differs from that used with respect to common and contract carriers. Whether or not it is somewhat more limited in its meaning remains to be determined, says Commissioner Joseph B. Eastman, head of the Motor Carrier Division of the I.C.C., but in any event the authority granted is very broad.

The law does not give the commission authority to fix the sizes and weights of motor vehicles, except in so far as such requirements are related to safety of operation and equipment; but the commission is authorized to investigate and report to Congress on the need for federal regulation of sizes and weight and combinations of motor vehicles. The safety matter bristles with opportunities for conflicts of jurisdiction between state and federal authorities. A significant feature of the safety provisions of the federal law is the tendency they will have to promote greater uniformity in regulations, in so far as that is desirable, and reasonable reciprocity arrangements between the states.

The new law will cause many perplexities to manufacturers and distributors in the food field, whether they operate their own trucks or employ common or contract carriers for hauling their products. Regulation will be decentralized as much as possible. The commission is setting up an extensive field organization that, according to Commissioner Eastman, will be instructed that its duty is not merely to enforce the law, but to be of help to many who will wish to obey it but may not know how.

FOOD truck operators, whether common or contract carriers, should immediately take initial steps to comply with the law. This simply means that to operate trucks as a common carrier, it is necessary to obtain a certificate of public convenience and necessity from the I.C.C. If a trucking firm was actually engaged in common carrier operations on June 1, 1935, the commission will issue such certificate without further proof of public convenience and necessity, provided that application is made within 120 days from Oct. 15, 1935, on Form B.M.C.1. Otherwise, formal procedure must be followed and the certificate may or may not be forthcoming.

To operate as a contract carrier requires a permit. If a concern was actually engaged in such business on July 1, 1935, the permit will be issued upon application, also to be filed within 120 days of Oct. 15 on Form B.M.C.1. The commission is now issuing the application blanks to be filled out and filed under the so-called "grandfather clause." Do not be surprised if it takes the commission a year or longer to pass on as many as 250,000 applications. Under the law the rights of all operators who have their applications on file are protected until they are acted upon, one way or the other.

Newcomers who want to enter the common or contract carrier business must support their application with proof that the proposed service is or will be required by public convenience and necessity, in the case of common carriers, and that the applicant is fit, willing and able to perform the service, in the case of contract carriers.

After Jan. 1, 1936, no trucker may at the same time operate as a common carrier and a contract carrier over the same route or within the same territory unless authorized by the commission. The permit does not restrict the right of a contract carrier to substitute or add new contracts nor to increase the number of his trucks, within the scope of the permit, as business may demand, but he cannot extend his operations beyond the territory covered by his permit without filing a new application.

AFTER filing application for a certificate of public convenience or a permit to operate, the next step is to file rates and charges on or before Dec. 1. Contract carriers must publish, file with the commission, and keep open for public inspection, a schedule of minimum charges for service and the rules affecting the charges or the value of service thereunder. Contracts showing the minimum charges, etc., may be required, in the discretion of the commission. Charges lower than those filed are prohibited. Common carriers must file tariffs showing rates, rules and practices and keep them open for inspection, likewise designate a statutory agent in Washington and in each state in which operations are carried on for receipt of notices or service of processes. Changes in the published rates of common and contract carriers may not be made on less than 30 days' notice, except with the commission's approval.

Initial rate schedules or contracts filed by carriers may not be suspended by the I.C.C.—that is, may not be prevented from going into effect. They must be filed with the understanding, however, that they may thereafter be changed by the commission, after appropriate proceedings, if it finds them unlawful under the provisions of the law. In other words, both common and contract operators must take the risk that they can defend their published rates and charges if they are attacked. The commission is empowered by the law, after hearing upon complaint or in an investigation on its own initiative, to fix the rate or the maximum and minimum rates of common carriers. With respect to contract carriers, the commission's authority is limited to fixing the minimum charge.

Of particular interest to the food industries is the exemption from the provisions of the law (except those relative to the qualifications and hours of service of employees and safety of operation or standards of equipment) of trucks used exclusively in carrying agricultural commodities, including livestock, fish and shell fish. This exemption does not extend to the manufactured products of agricultural commodities.

TO ADMINISTER the law a Bureau of Motor Carriers has been set up within the I.C.C. under the direction of John L. Rogers, with George A. Casey, as assistant to the director. The bureau will consist of two divisions, the technical division consisting of nine sections under Park M. Smith, as assistant director; and a field division, consisting of sixteen regional districts under W. Y. Blanning, as the other assistant director. The technical division is located in the I.C.C. building in Washington and is set up as follows:

1. Certificates and Insurance—including permits, licenses, surety bonds and insurance. Chief of section, H. M. Roberts; assistant chief, H. L. Callanan.
2. Finance—including mergers and securities. Chief of section, J. Edward Ravey; assistant chief, Grover L. Swink.
3. Traffic—including rates, classifications, tariffs, concurrences, suspensions and divisions. Chief of section, Walter Hays.
4. Accounts—Chief of section, Maurice E. Sheehan.
5. Statistics—Chief of section, not yet announced.
6. Research—Chief of section, not yet announced.
7. Complaints—including formal and informal cases and service matter. Chief of section, W. A. Hill.
8. Safety Regulations—including hours of service. Chief of section, H. H. Kelly; assistant chief, George R. Wellington.
9. Legal and Enforcement Matters—Chief of section, Jack G. Scott.

The development of rail regulation has furnished the pattern for regulation of motor carriers. The basis of regulation established by the Motor Carrier Act is much broader than that first applied to the railroads in 1887. It is perfectly clear, however, that the I.C.C. has a job on its hands that is not at all the same as regulating the railroads, and the commission is specifically instructed by Congress to regulate motor transportation with regard to its "inherent natural advantages"; in other words, to adapt regulation to the nature and characteristics of this particular form of transportation.

PROCEDURE for administering the law is likely to be slow in developing. Various features may require as much as ten years to become effective in operation. In many respects, this year's law is only an overture to further statutory enactments; but, in general, it is safe to say that regulation of motor carriers will never become as elaborate as rail regulation as, in high transportation, the option of shippers to own and operate their own equipment provides an automatic check.

From time to time FOOD INDUSTRIES will publish news of developments as they pertain to contract and private carriers. Questions pertaining to these phases of the new law will be handled promptly by mail. Because the common carriers are in a business of their own, somewhat analogous to railroad service, FOOD INDUSTRIES will cover only those phases of the law's administration that are pertinent to the food industries.

READERS of *Food Industries* are invited to send us their questions regarding the operation of motor trucks as private and contract carriers under the new law, "The Motor Carrier Act," also known unofficially as the Eastman Law or the I.C.C. Trucking Law. Arrangements have been made to secure the best available opinion where definite official answers are not yet available.

Practical Problems of
TRUCK TRANSPORTATION

DISCUSSED BY EXECUTIVES IN THE FOOD INDUSTRIES

Preventative Motor Truck Maintenance

Question No. 12

1. Does it pay to set up some form of preventative motor truck maintenance in the operation of a fleet in the food field?
2. Of what should this preventative maintenance consist?
3. Are periodical inspections the backbone of what you consider adequate preventative maintenance to be?
4. If so, at what mileage or time intervals should such inspections be made?
5. What records or paper-work do you consider are essential to follow through on the procedure of preventative maintenance that you favor?

Uses Systematic Lubrication

ANSWERS to your questions are listed below:

1. Yes.

2. Oil change, lubrication and general check-up, repairs made promptly.

3. Yes.

4. We have made it a policy to change oil at 1,000 miles, to lubricate at 800 miles. We check wheel bearings every six months. We also have a general check-up made three times annually.

5. A chart listing truck numbers and speedometer readings showing when oil change and lubrication are due. We also keep a file-card system showing oil changes, lubrications, repairs and tire details.

I might add that we find it more beneficial to lubricate on a mileage basis, rather than weekly or monthly, the reason being some of the trucks travel 600 to 800 miles each week, and others travel this same mileage in a month's time. —GEORGE E. GREANEY, *Traffic Manager, Diamond Ginger Ale, Inc., Waterbury, Conn.*

Inspects Every 5,000 Miles

IT IS most essential to set-up some form of preventative motor truck maintenance for successful operation, especially in the food field where delay, break-down, or any other interruption due to mechanical failures is a serious item.

The preventative maintenance we feel should consist of periodical inspection and making minor adjustments from time to time as they are brought to the attention of the maintenance force by the operators, who should be trained to report even minor things as they might develop into something serious at some future time.

We base our periodical inspections for road trucks on a mileage basis of 5,000 miles. On local trucks operated within the city limits which do not cover the same mileage as the road trucks on basis of three-month periods.

We use two different types of inspection. One we term motor and accessory inspection, the other chassis inspection.

It requires on the chassis inspection two men from five to eight hours including the making of minor adjustments which are required as they go along.

The major work required to be done is recorded and handled on a scheduled basis, as too many units cannot be held out of service at the same time.

In addition, we also use a report which is compiled on a four-weeks basis so that all periods will be for identically the same number of days. This report primarily covers the miles per gallon of gasoline consumed and quarts of oil for the number of miles which each unit has traveled in that period of time.

From the gasoline and oil report we are able to check performance and motor efficiency.

In the servicing of our fleet it requires night service. The major function is to check oil and change oil on a periodical basis. Along with this, the mechanic also makes a number of minor adjustments such as tightening up of fan belts, stopping of leaks in water pumps, spring inspection for broken leaves, inspection of tires for flats especially on the equipment equipped with dual rears. This service also includes the filling of radiators in order to avoid guess work or failure of the operator to properly check these items.

I might say also that incidental to our tire inspection, which is handled once each week, batteries are checked and wheel alignment, by means of a special instrument secured for the purpose, known as a Wee Gee Board.

I believe the above will give you some general idea of the preventative maintenance conducted at our plant in connection with our fleet of 48 motor trucks and 27 passenger type units.—H. E. WENNAGEL, *Traffic Manager, The Wm. Schluderberg-T. J. Kurdle Co., Baltimore, Md.*

Methods for Reducing Truck Accidents

Question No. 13

1. What fundamental practices have you found essential in reducing truck accidents?
2. Do safety committees, company traffic courts or safety contests with buttons or cash prizes really help to reduce accidents?
3. Does it pay to give drivers who have had accidents time-off without pay instead of discharging them?
4. What percentage of accidents in your truck fleet has been due to mechanical failures?
5. Of what value in reducing accidents are mechanical or electrical directional signals?

Safety Council Cooperation Helps

REGARDING the reduction of motor vehicle accidents, I will say that this has been a very serious problem with us and we have been very faithful in trying to eliminate accidents as far as possible.

Answering questions 1 and 2, we have had very good results working through the Massachusetts Safety Council, which has been sponsored by the State Government. Recently, this has been changed and is now an organization apart from the government. Also, our insurance company has been very helpful.

We have meetings very often with our salesmen drivers. We use a card which is separated into twelve squares, using a stamp for each square which we call a merit stamp, showing that the salesman did not have an accident for the particular month. We also have the buttons given for each year, and have many men who are wearing five-year buttons.

In answer to question 3, we have tried both ways in dealing with accidents, sometimes laying men off for a period, and at other times requiring them to pay for minor accidents. But we do not feel that there is much gained in either case. If a man has three accidents within a certain period, he is automatically dismissed.

We have had a very small number of accidents due to mechanical defects—only two that we are absolutely sure of.

In answer to question 5, we have tried nearly all of the electrical devices

and hand-operated directional signals, but have not adopted any particular one. They all have some merit, to be sure; but we feel that a salesman should be alert in giving the regular hand signals, and we stress this point at every meeting and believe this is working to the best advantage.—ROBERT FRIEND, *Friend Brothers, Inc., Melrose, Mass.*

Awards Reduce Accidents

THE ANSWERS to your questions concerning accident prevention are, briefly, as follows:

1. Fundamentally, we consider accident prevention a regular part of every employee's performance record.

2. Committees, courts, contests, and safe drivers' awards do help to reduce accidents.

3. Discipline for poor accident records should take the same form as for any other performance failure.

4. Detectable mechanical failures have never been responsible for more than one-half of one per cent of our accidents.

5. Directional signals will help prevent accidents if they are used. Their installation should be followed with an attempt to enforce their regular use.—HENRY J. MINEUR, *Director of Safety, Borden's, New York, N. Y.*

Pays a Bonus

CONCERNING your questions about reducing truck accidents:

The best, and only, way I have ever found to reduce truck accidents, also to save gas and oil, and reduce repairs of all kinds, is to put up a bonus of some kind. That will surely bring accidents to a halt and will also make some difference in the automobile insurance cost. In all my experience that is the only way out.

I have had no accidents caused by mechanical failure. All the accidents that have occurred to my trucks have been due to downright neglect.

Since I put the bonus into effect, I do not have three accidents a year. If a man has an accident, he loses his bonus for the month and also pays for all repairs.—H. C. TILL, *Manager, Blackwood Model Bakery, Blackwood, N. J.*

Depends on Personal Supervision

FROM OUR EXPERIENCE, the answers to your questions on reducing truck accidents are:

1. Make sure equipment is in good mechanical condition. Drivers are instructed that we expect sane, orderly driving and handling of equipment. Any mechanism that is defective or not operating properly is to be reported, so that necessary repairs or adjustments may be made. I also personally drive over the territory covered and am on the lookout for our trucks, to see how they are being driven. If on these inspections I find instances where there is something at fault, I take it up with the drivers individually.

2. I do not know, as we have never had any experience with any of these modes of procedure. I do not believe there is anything more satisfactory than a little personal supervision.

3. I do not know, as we have not had to resort to this method so far.

4. None in the past year.

5. Have never used any.—A. F. SMITH, *Manager, Beatrice Creamery Co., Davenport, Iowa.*

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Separate Salesmen Or Peddle Truck Routes

Question No. 14

1. In the distribution of food products such as fresh meats, prepared meat products, butter, eggs, cheese, poultry, ice cream, milk, bread and potato chips to retail store outlets, is it better to employ peddle truck routes on which the driver also takes the orders than to use a separate corps of salesmen to solicit the business with the truck driver simply delivering the goods? If so, why?

2. Which method provides the lowest cost per hundred pounds delivered?

3. Can the separate corps of salesmen, if provided with cars at company expense, or allowed mileage for privately-owned cars, procure sufficient additional business to offset the motor vehicle expense as compared with peddle truck routes with driver salesmen?

4. Or is a combination of both salesmen and peddle truck route driver salesmen the most desirable method of distribution?

Drivers Handle Accounts

WE feel that the distribution of ice cream involves an entirely different problem than that of other foods which are not quite as perishable and whose turn-over is not quite as rapid.

It is customary in the distribution of ice cream to obtain the wholesale outlets on a 100-per cent basis. There are few retailers of ice cream handling more than one brand. This makes sales an entirely separate problem from distribution.

Accounts once sold can be handled very successfully by an ordinary driver with an occasional contact by a salesman to maintain good-will. This, I think, answers your first question.

As to your second question, undoubtedly, the cost per unit is higher with a separate group of drivers and salesmen than it would be if they could be combined into one group. We do believe, however, that salesmen can procure enough additional business to offset their traveling expenses, including the allowance on cars.

Obtaining outlets requires a long siege, possibly over many months, and necessitates a degree of concentrated effort which it would be impossible for driver-salesmen to give.

We try, as far as possible, in introducing a new flavor or a new item, to have the drivers carry on the sales work with all of the existing outlets. We do not find that this can be done entirely, inasmuch as our drivers are not trained for that type of work.—E. W. CREDICOTT, *Assistant Manager, Freeport Dairy Products Co., Freeport, Ill.*

Combines Sales Efforts

WE ARE of the opinion that driver salesmen on our delivery trucks are the most effective, because they keep in closer contact with the point of sale. In reference to paragraph three, we also have separate salesmen who work on new business and see that advertising is properly displayed. They also take care of any accounts that should happen to get in arrears. Therefore, we think it is necessary to work the combination of the two—route-driver salesmen and city salesmen.

We think it is better for us to furnish city salesmen with cars rather than give them mileage or have them furnish their own cars. The cost of car operations proves this to be more satisfactory.—W. A. FREEMAN, *Furnas Ice Cream Co., South Bend, Ind.*

Driver Salesmen Preferred

WE use driver salesmen and find them most successful, because of the nature of our business. Bread is such a competitive item that many stores have at least ten different makes and sometimes four or five varieties from each baker. So it is quite necessary for us to guard our display carefully, bread in our markets being sold on a strictly consignment basis.

As to the relationship between the volume of sales of a given make of bread and the number of trucks operating in any definite area, we may say that the more trucks and driver salesmen you have in a territory the more business you are able to secure. But by the same token, the type of territory must be considered seriously, for the sales per individual store is the only barometer.—A. M. EVANS, *Wholesale Sales Manager, Hathaway Bakeries, Inc., Cambridge, Mass.*

Uses Direct Delivery

WE find it best to use salesmen and direct delivery. This is because we have a certain amount of chain-store business which we have to deliver direct and also because we sell beef. You cannot haul beef on peddler trucks.—E. J. FOCKE, *Wm. Focke's Sons Co., Dayton, Ohio.*

NEW EQUIPMENT
for Food Manufacturers

Slicing, wrapping and sealing machine.

Slicer and Wrapper

A COMBINATION machine for slicing, wrapping and sealing loaves of bread has been developed by Oliver Machinery Co., Grand Rapids, Mich. It is called the "Slicer-Wrap-Sealer," and is supplied in 16 in. and 13¾ in. sizes.

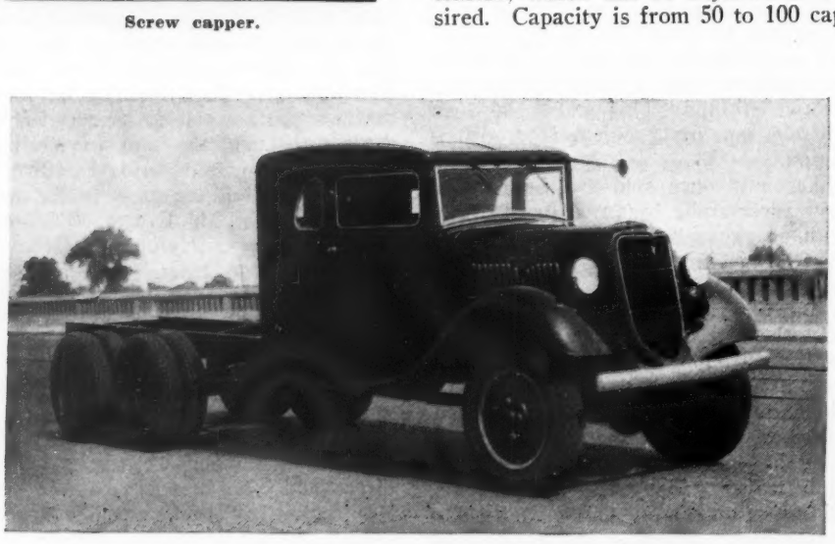
The machine is of compact design and is arranged so that the operator can slice, wrap and seal in natural standing position. The gravity feed slicer delivers the bread to a wrapping table where it can be wrapped in wax paper or transparent cellulose, as desired. A semi-automatic holder is provided to hold the bread while wrapping, after which it is pushed through a sealer having adjustable thermostatic heat control.

Screw capper.

Screw Capper

FOR placing all kinds of screw caps, Scientific Filter Co., Franklin Square, New York, N. Y., has introduced a machine called the S. F. Whirlwind Capper. This is a hand-operated machine, not an automatic. By changing the chucks, it can be quickly adapted to any size of caps. It is actuated by an electric motor.

In operation, the machine is suspended from the ceiling by wire and a coil spring, permitting operation over a wide area. The caps are placed on the containers lightly by hand, the machine then tightens them to the desired tension, which can be adjusted as desired. Capacity is from 50 to 100 caps per minute, depending upon the operator and the plant arrangements.



All-wheel-drive truck.

Reset Controller

AN AUTOMATIC process controller, called the "Reset," has been developed by Taylor Instrument Companies, Rochester, N. Y. In general it controls a temperature, pressure, rate of flow, or liquid level in a predetermined relation to some other temperature, pressure, rate of flow or liquid level. It can be used on all applications where a fixed differential must be maintained between two variables, or where it is desired to change the control point of a process in accordance with a predetermined ratio to a secondary process or condition.

The device is provided with an adjustable linkage which permits control point changes in a great variety of ratios between controlling and resetting systems. Two types of ratio adjustments are possible, direct and inverse.

Scale Remover

A DEVICE for removing and preventing scale in tanks and other equipment in which water is heated, has been introduced by John G. Kelley, Inc., 210 East 45th St., New York, N. Y. It is called the "Scale-Buoy," and is a sealed, special-glass container, holding three inert gases and treated mercury. The containers will stand 400 deg. F. temperature and 1,000-lb. pressure.

In operation, the device is agitated within the tank. This causes friction between the mercury and the glass, building up a potential inside the container. This voltage creates a magnetic field which equalizes the magnetic attraction of the mercury atom for its electrons. Liberated electrons emanate through the glass into the water, where they are said to inhibit scale formation and remove already-formed scale. Corrosion is also claimed to be prevented.

All-Wheel-Drive Truck

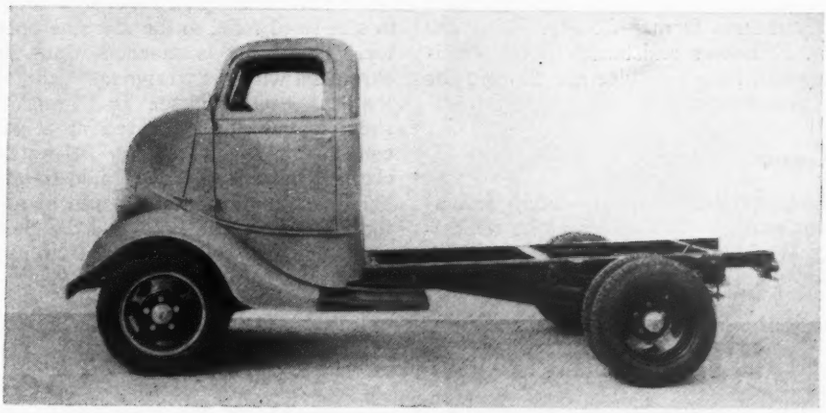
BY installing specially designed driving front axles and propeller shafts, and other necessary parts, Marmon-Herrington Co., Indianapolis, Ind., has developed a line of all-wheel-drive trucks based on the standard Ford V-8 truck chassis. There are four models in the line. Two are four-wheel-drive units;

the B 5-4 with wheelbase of 132 in., and the B 6-4 with 157½ in. The other two are six-wheel-drive units. Four-wheel-drive units have a maximum gross capacity of 13,200 lb.; six-wheel drives, 22,000 lb.

Cab-Over-Engine Truck

AN ADAPTION of the Ford V-8 truck to a cab-over-engine design of tractor has been made by Highland Body Mfg. Co., Cincinnati, Ohio. As illustrated, this tractor uses a standard 131 in. wheelbase Ford chassis, on which the standard Ford cab has been moved forward from its original position and placed slightly higher. This gives greater visibility and improves the cooling.

The same adaption is also made for use as a straight truck. In this case, it has the advantage of permitting the use of a longer body. For instance, on the standard 157 in. wheelbase, it is possible to mount an 11 ft. 4 in. body. On the cab-over-engine model, with the same wheelbase, a 14 ft. 2 in. body can be used with the same weight distribution on the rear axle.

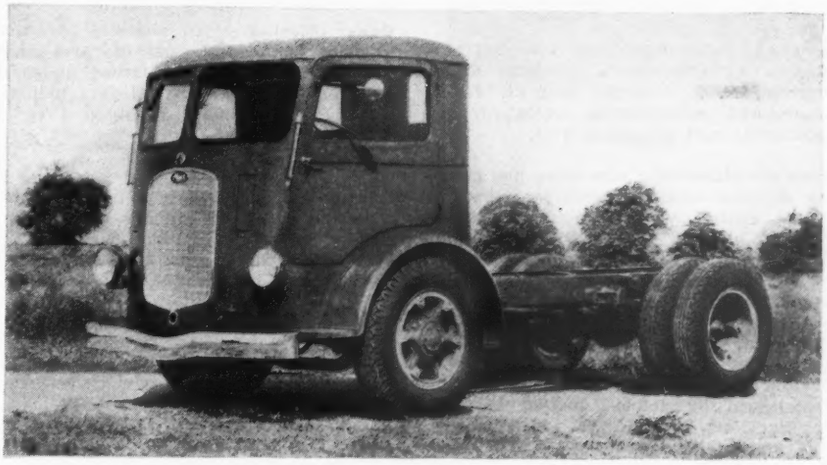


Cab-over-engine adaption of Ford truck.

Roll-Out Engine Trucks

CAB-OVER-ENGINE trucks of streamlined design with roll-out engines have been introduced by Mack Trucks, Inc., 25 Broadway, New York, N. Y. These models, "CH" and "CJ," are traffic type trucks, with integral all-metal roofed cabs. The engine can be withdrawn through the front for accessibility.

In these new Macks, wheelbases are 6 in. shorter than in previous models, for the same platform length, and the trucks have shorter turning radii and shorter overall length. The "CH" has a 108-hp. motor; the "CJ" a 118-hp. motor. In designing the cabs, particular attention has been given to driver comfort.



Cab-over-engine Mack truck with roll-out power plant.

Anemometer

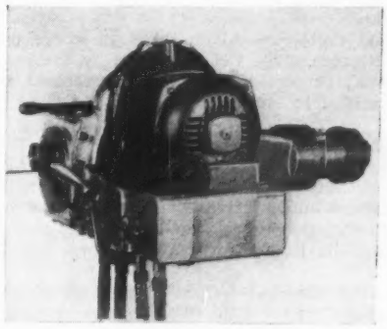
SPECIALLY designed for measuring slow air movements, such as occur in refrigerator cars, a new type of anemometer has been developed by the Bureaus of Agricultural Engineering, and of Plant Industry, U. S. Department of Agriculture, Washington, D. C. Operation of this instrument depends on the cooling of heated wire when exposed to air currents. The instrument is small enough to be placed under the floor rack of a car and may be read from outside without disturbing conditions within.

Paper Coating

SOLUTIONS for coating, impregnating and laminating paper and cardboard are announced by the Sealkote Corporation, 40 South Clinton St., Chicago, Ill. These solutions are said to produce a water, grease and oilproof film. When desired, a high gloss finish can be produced with them. Application is claimed to be simple, not requiring new or expensive machinery.

Metal Spraying Device

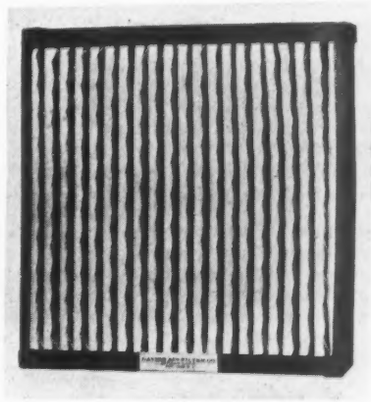
FOR coating worn equipment, parts, or other metallic constructions with a layer of sprayed-on metal, Gillord Sales Corporation, 420 Lexington Ave., New York, N. Y., have recently brought out a new spraying device. The metal to be sprayed on is fed into the machine in the form of wire, and then melted in a small melting chamber in the head. It is then sprayed by means of controlled gas pressure. With this machine, it is said that 12 to 15 lb. of steel per hour, 25 to 35 lb. of copper per hour, and corresponding amounts, depending on melting point, of other metals can be sprayed.



Device for spraying coatings of metal.

Air Filter

AN AIR FILTER of the replaceable, dry type is announced by Davies Air Filter Corp., 390 Fourth Ave., New York, N. Y. This filter is called the "Improved Airplex." The filter medium is a processed cotton material, pleated 80 times, so that 30 sq.ft. is contained in a frame 20x20x4 in. It is designed to operate at



"Improved Airplex" air filter.

temperatures from —32 deg. F. to 200 deg. F. Lower resistance, higher efficiency and longer service are claimed for the new design.

Sheeter

A RECENTLY developed sheeting attachment, made by Miller Wrapping & Sealing Machine Co., 18 South Clinton St., Chicago, Ill., supplies single sheets cut to size from rolls, to the machine operator. The device is attached to and synchronized with the wrapping machine so that, as each package is wrapped, a sheet is cut and delivered at a point convenient for placing. Advantages claimed for this device include speed of handling, avoidance of the use of more than one sheet at a time, and the cheapness of the roll compared to precut sheets.

The Manufacturers Offer . . .

Diaphragm Pumps — Two new circulars issued by T. Shriver & Co., Harrison, N. J., describe diaphragm pumps and their applications.

Air Conditioning Equipment—Several new bulletins of Carbondale Machine Corp., Harrison, N. J., describe unit air conditioners and refrigerating units for air conditioning and general service.

Tying Machines—For wire tying and strapping shipping containers and packages, the line of equipment manufactured by The Gerrard Co., 2915 West 47th St., Chicago, Ill., is described in a recent bulletin.

Sound Deadening—An illustrated booklet entitled "Sound Control of Mechanical Equipment," No. DS Series 275, discussing the deadening of sound from refrigerators, burners and other equipment has recently been issued by Johns-Manville, 22 East 40th St., New York, N. Y.

Wire Products—Nails, screens and other wire products are listed and priced in a new catalog recently issued by the Republic Steel Corp, Youngstown, Ohio.

Dust Collector—All metal cloth screen dust collectors, Type CH, produced by Pangborn Corp., Hagerstown, Md., are described and specified in Bulletin No. 197.

Alloy Steel—A reprint from the July, 1935, number of *Metal Progress* entitled "Alloy Sheet Steel," and discussing copper nickel molybdenum steel alloys, is by Howard L. Miller, metallurgist, and is distributed by Republic Steel Corp., Youngstown, Ohio.

Motor Trucks — "25 Years of Federal Trucks" is the title of a 32-page illustrated brochure published in honor of its 25th anniversary by Federal Motor Truck Co., Detroit, Mich.

Screw Anchors — Wood screw anchors called "Rawlplugs" are discussed in a new booklet issued by the Rawlplug Co., Inc., 98 Lafayette St., New York, N. Y.

Refrigeration — The thermostatic surge drum, a device for improving the operation of ammonia refrigeration systems, is described by York Ice Machinery Corp., York, Pa., in a bulletin numbered S.P. 35250.

Insulation—Insulating products for use at any temperature between 400 deg. F. below zero and 2,500 deg. F. above, are described and illustrated in a 64-page booklet entitled "Barriers to Industrial Waste" published by Johns-Manville, 22 East 40th St., New York, N. Y.

Mixers—Industrial mixers for use by bakeries, confectionery plants and other food manufacturers are specified and illustrated in a new 8-page bulletin of Read Machinery Co., Inc., York, Pa.

Power Alcohol — An analysis of various schemes to force the use of farm alcohol in motor fuel has been issued under this title by American Petroleum Industries Committee, 322 South Michigan Ave., Chicago, Ill.

Flavors and Colors—A new price and reference list for food manufacturers and others using essential oils, flavors, aromatics, colors and other chemicals, has been issued by Dodge & Olcott Co., 180 Varick St., New York, N. Y.

Lubricating Guns—A 54-page catalog of Alemite Corp., Chicago, Ill., discusses lubricating guns, fittings and accessories for industrial purposes.

Sugar Equipment—Catalog No. 1455, issued by Link-Belt Co., 910 South Michigan Ave., Chicago, Ill., in Spanish, covers various types of conveying and power transmitting chains suited for use in the sugar mill.

Microscopes—A 30-page catalog published by Bausch & Lomb Optical Co., Rochester, N. Y., gives descriptions and specifications for their line of laboratory microscopes and accessories.

Rubber Belting—A booklet entitled "Continuous Vulcanization of Transmission Belting" published by Boston Woven Hose & Rubber Co., Cambridge, Mass., discusses an improvement in the manufacture of this product which is said to produce a superior belt.

Handling Equipment — Circular No. 311, Lewis Shepard Co., 236 Walnut St., Watertown, Mass., is entitled "The Most Efficient Low Cost Material Handling System Yet Devised," and discusses hand-lift trucks, platforms and accessory equipment.

Industrial Truck Tires—In a 4-page booklet entitled "Pneumatic Tires for Wheelbarrows and Industrial Trucks," B. F. Goodrich Co., Akron, Ohio, gives specifications of various tires developed for this application.

Compressors and Pumps—Two new bulletins have been issued by Worthington Pump & Machinery Corp., Harrison, N. J., as follows: No. L-611 B3A, describing steam booster compressors; No. W-450-B19, describing Types Q and QA deepwell turbine pumps for water supply.

Air Heaters—For use with drying and processing equipment, air heaters of several types are discussed in a 16-page bulletin, No. 122, issued by J. O. Ross Engineering Corp., 350 Madison Ave., New York, N. Y.

Blowers — "Victor-Acme" rotary positive blowers for pressure or vacuum service are the subject of Bulletin 21-B17 issued by Roots-Connersville Blower Corp., Connersville, Ind.

Gearmotors—Electric motors with self-contained speed reducers mounted on the same base are discussed by Allis-Chalmers Mfg. Co., Milwaukee, Wis., in leaflet No. 2203.

Lubrication — Lubrication of the essential machinery in the canning industry is the subject of a 12-page article published in *Lubrication* a periodical publication of The Texas Co., 135 East 42d St., New York City, for July, 1935.

Wire Cloth—Three catalogs, Nos. 40, 41 and 42, specify, describe and picture woven wire products of different types for various industrial uses, made by Audubon Wire Cloth Corp., Philadelphia, Pa.

Bearings—Ball and roller bearing pillow blocks, flange housings, take-up boxes, drop hangers and other accessories are described in a recent catalog of SKF Industries, Inc., Front St. and Erie Ave., Philadelphia, Pa.

Motor Starters — Types XLA, XLB and XLBB, automatic motor starters, are described in two recent leaflets of the Lincoln Electric Co., Cleveland, Ohio.

Belt Conveyors—Catalog No. 610 is a new general catalog of standardized belt conveyors and accessories for all purposes, published by the Jeffrey Mfg. Co., Columbus, Ohio.

Mixing Equipment—Mixers and autoclaves of various metals and of various types are the subject of Bulletin No. 13 issued by Struthers-Wells Co., Warren, Pa.

Steam Storage—The storage of steam in Ruths accumulators is discussed in Bulletin RA-35-5 published by Foster Wheeler Corp., 165 Broadway, New York, N. Y.

Power Equipment—Three new bulletins of Combustion Engineering Co., Inc., 200 Madison Ave., New York, N. Y., discuss boiler plant equipment; the C-E stoker unit for building heating; and pressure vessels fabricated by welding or riveting.

Tires—Solid and pneumatic tires for industrial trucks, storage battery trucks and other industrial equipment are the subject of a 24-page catalog issued by B. F. Goodrich Co., Akron, Ohio.

Fruit for Bakers — Hills Bros. Co., 110 Washington St., New York City, has issued a manual for bakers entitled "Fruit Specialties—And a Word About Cake Sales."

Lift Trucks—The "Zephyr" line of hand-lift trucks and skid platforms, for loads to 1,000 lb., is described in a recent bulletin of Yale & Towne Mfg. Co., Philadelphia Division, Philadelphia, Pa.

Monel Metal Accessories — Bolts, screws, pins, rivets and other accessories of Monel metal are listed and specified in Bulletin H2, The International Nickel Co., 67 Wall St., New York, N. Y.

IDEAS
from Practical Men

Remote Pump Control

REMOTE control of two motor-driven pumps which fill the hoppers of a battery of ice-cream packaging machines has been provided in one of the plants of Pioneer Ice Cream Brands, Inc., New York City. The switch on each of these motors is of the type that is pushed for starting and pushed again for stopping. Operating these push buttons are levers actuated by wires. These wires extend overhead along the battery of machines, and by pulling on them an operator can start or stop either of the motors from any point. To obviate reaching up for the wires, short lengths of wire with wooden handle grips at the lower ends are attached to the overhead wires, extending down to within easy reach. These may be slid to any desired position.

Plant Incinerator

FOOD plants located in the country, where the problem of waste disposal makes the use of an incinerator helpful, will be interested in the expedient adopted by a canning plant not long ago. This plant had on hand an old boiler breeching, which had been around for a long while and was a nuisance because of the space that it occupied. It was decided to employ this breeching as an incinerator by cutting an opening in the side and equipping it with a door.

This makeshift incinerator has now served satisfactorily for some time. Corrosion rusted off the hinges so that the door is no longer in place; but the incinerator still functions. It will hold about 2 tons of ashes before it is necessary to empty it.

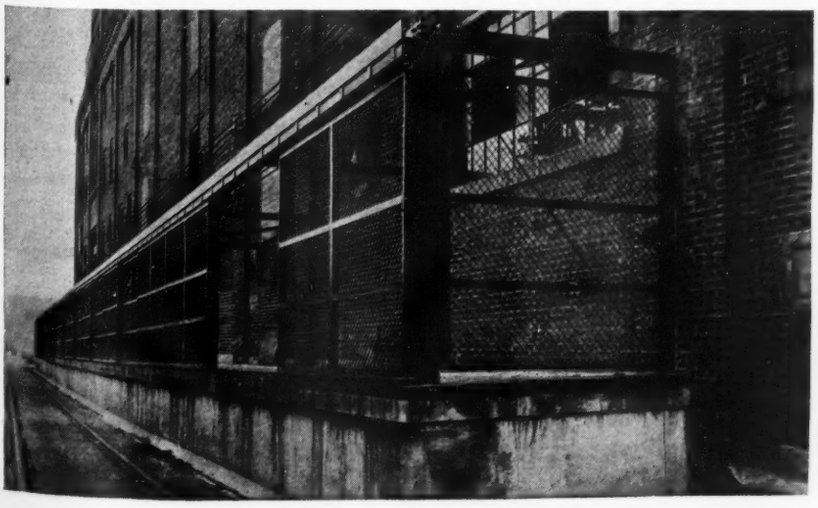
Incinerator made from an old boiler breeching.

Convenient Unloading Dock

NO TIME is wasted in moving freight cars into exact position for unloading livestock at the plant of Arbogast & Bastian Co., Allentown, Pa. The doors do not have to be opposite fixed doors in the unloading dock fence, because the latter is made up entirely of doors. Designed by the company's engineers for the new four-car concrete siding, the fence consists of 22 sliding doors, each about 12 ft. long and 8 ft. high. Suspended alternately in a double track, adjacent doors can slide past each other, permitting the enclosure to be opened at any point.

No obstructing posts occur anywhere along the dock, except at the corners, because the double track for the doors is suspended from the building wall by means of a cantilever truss construction.

Built with a channel iron frame covered with heavy woven-wire, the doors are equipped on the bottom with a channel member which slides over a flat iron guide. The two end doors hang from the corner-posts on gate hinges and there are other swinging doors along the platform to direct the hogs and cattle into their respective pens.



Double sliding doors at unloading dock.

Roll-Up Hose Hanger

IN plants where water and steam are used at regular intervals for cleaning and sterilizing, the type of hose connection and mounting employed in one of the plants of Pioneer Ice Cream Brands, Inc., New York City, can be used to advantage.

In this plant, hot and cold water and steam are used, and the three pipes for these services are brought from overhead mains, through gate valves, into a common outlet. The hose which carries the water and steam to the point of application is coiled about a drum, rotatably supported on brackets about 6 ft. above the floor. This drum has circular handrails at each end to facilitate winding up the hose.

The inlet end of the hose connects to a pipe extending along a radius of the drum and joined by a swivel joint to a pipe leading from the common water and steam outlet. The drum can be turned without loosing the hose.

With this arrangement, the operator has merely to adjust the valves for the desired flow, take the nozzle end of the hose in hand and walk to his cleaning or sterilizing job. When finished, he gives the drum a few turns and the hose is rolled up out of the way.

BUSINESS TRENDS

Ample Crops Available

IN its October crop report, the Department of Agriculture shows that the raw material base of the food industries is in generally good condition, with no weak spots other than those already known and consequently discounted. Salient figures from this report follow:

Crop	1935 Yield	Five-Year Average
Corn.....	2,213,319,000 bu.	2,562,000,000 bu.
Wheat.....	598,935,000 bu.	861,000,000 bu.
Oats.....	1,183,700,000 bu.	1,090,140,000 bu.
Peanuts....	1,239,880,000 lb.	938,880,000 lb.
Rice.....	38,918,000 bu.	*38,296,000 lb.
Hops†.....	47,080,000 lb.	28,000,000 lb.
Soybeans‡.	32,870,000 bu.	*27,000,000 bu.
Beans (dry)	14,005,000 bags	*10,369,000 bags
Potatoes...	365,995,000 bu.	363,367,000 bu.
Sweet potatoes.....	69,027,000 bu.	63,841,000 bu.
Apples.....	168,209,000 bu.	161,330,000 bu.
Peaches....	52,380,000 bu.	56,451,000 bu.
Grapes.....	2,327,348 tons	2,199,679 tons

*1934 yield. †Pacific Coast only. ‡Six states.

Fish Plentiful, Value High

LATEST reports of fish landings at New England ports show an increase of 9 per cent in quantity and 13 per cent in value, compared to the same period in 1934.

The quantity of fish in cold storage indicates that consumer demand for fish has increased, as would be expected with meat at high levels and eggs relatively high. Cold storage holdings of fish on the last date for which figures are available, Sept. 15, were 66,527,000 lb., a 10 per cent drop below the 73,637,000 lb. in storage on Sept. 15, 1934, and 2 per cent below the five-year average.

Freezing of fish is also falling off, the quantity frozen during the 30 days ending Sept. 15 being 16,719,000 lb., compared to 18,486,000 lb. during the same period a year ago.

Dairy Products Situation Better

EVIL days of last spring seem to have left the dairy industry, in so far, at least, as the general production situation is concerned. The basic factor of milk production per cow shows improvement, being now about 8 per cent above last year and the highest since 1929. Consequently, in spite of fewer milk cows, the total milk flow is about 4 per cent over 1934.

Butter has recovered its position, both as to quantity and relative price, so that the unprecedented butter imports of April, May and June not only ceased, but show no likelihood of recurrence, with European butter scarce and only about 2 cents per lb. below the U. S. level. Storage stocks of butter on Oct. 1, at 148,666,000 lb., were 23,000,000 lb. above the 1934 figure, and 28,000,000 lb. above the five-year average.

Cheese and frozen cream in storage also show ample figures, well above the five-year average.

One factor in the dairy situation that should make for stability, is the growth of casein production in the United States. In 1922, domestic casein production was only about 7,000,000 lb., around one-third of consumption. In 1934, it reached 37,331,000 lb., within 4 per cent of consumption. As this product provides an outlet for surplus fluid milk, its manufacture tends to steady the whole dairy market.

Edible manufactured milk products have been produced during recent months in greater quantities, with a total for the principal products 6.7 per cent above last year and 13 per cent above five-year average figures. This increase comes principally in butter, cheese, condensed and evaporated milk.

Price levels, particularly for butter, have advanced slightly during the past month, but have exhibited steadiness on the whole. The present situation, and immediate prospects of the industry are good, with winter firming of prices the only change in view.

Prices Hold Meat Back

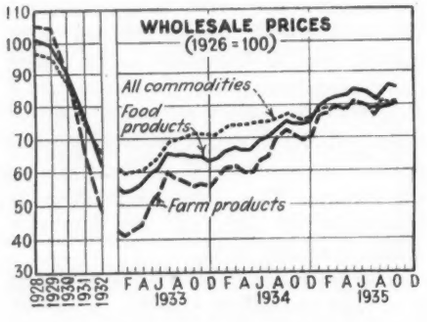
WITH meat supplies in storage the lowest on record, and slaughter still at a low ebb, the past month saw mixed trends in the meat packing field. Prices of animals for slaughter tended to rise through most of this period, until the last weeks saw increased deliveries of hogs and prices reacted.

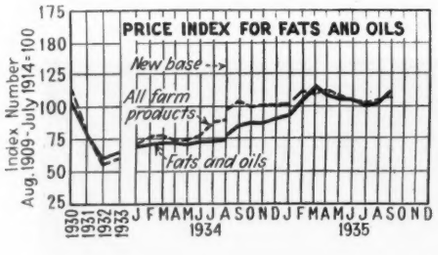
In contrast, consumer demand for meat products has been distinctly slack. Attempts to increase retail prices have met with definite consumer resistance.

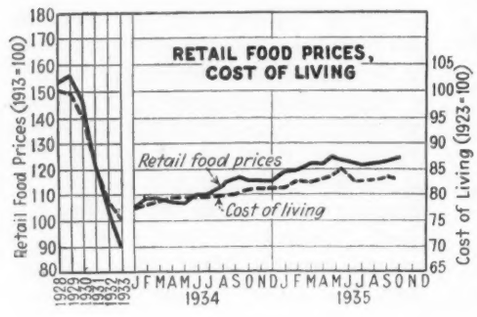
With no prospect for any considerable easing of the scarcity of cattle and hogs before next fall, it would seem that prices must be higher this winter; but it is impossible to forecast how strong resistance to higher meat prices will continue to be. No one can force people to eat meat, particularly when they cannot afford to buy it. Hence it is likely that packing operations will be closely geared to consumption for some months to come.

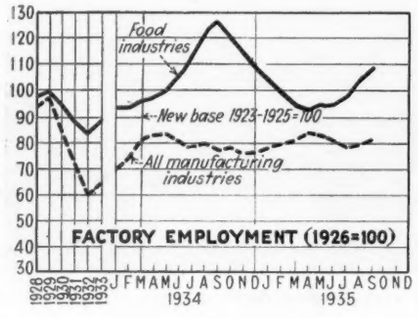
Less Meat in Storage

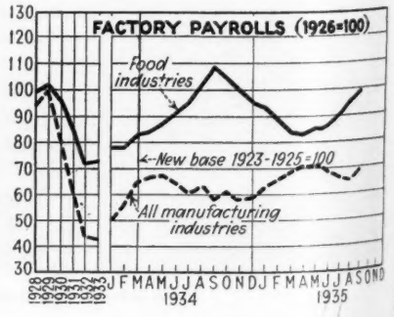
COLD STORAGE stocks of meat have reached a new low ebb, according to Department of Agriculture reports. On




PRICE INDEX FOR FATS AND OILS
Index Number Aug. 1909-July 1914=100
New base -->
All farm products
Fats and oils
1930 1931 1932 1933
J F M A M J J A S O N D J F M A M J J A S O N D
1934
1935


RETAIL FOOD PRICES, COST OF LIVING
Retail Food Prices (1913=100)
Cost of Living (1923=100)
Retail food prices
Cost of living
J F M A M J J A S O N D J F M A M J J A S O N D
1934
1935


Food industries
New base 1923-1925=100
All manufacturing industries
FACTORY EMPLOYMENT (1926=100)
J F M A M J J A S O N D J F M A M J J A S O N D
1934
1935


FACTORY PAYROLLS (1926=100)
Food industries
New base 1923-1925=100
All manufacturing industries
J F M A M J J A S O N D J F M A M J J A S O N D
1934
1935

Business Activity Rebounds

SETTLING of the coal strike, renewed production in automobile and closely allied industries, appreciable pick-up in total carloadings, and increased retail sales gave general business activity a rebound during early October which completely wiped out the sharp dip of late September. As October passes into the fourth week this activity continues on the level established during the middle weeks of September, the highest level for the period since 1931. For the four ending Oct. 19 the *Business Week* index at 67.4 per cent of normal showed a net rise of 1.05 per cent.

Commodity prices, especially those of consumer goods, weakened after a slight rise but are again indicating an upward trend. Fluctuations, in the main, have been narrow and bear witness to a consumer resistance which will not be easy to overcome due to the slowness with which salaries and wages are being increased.

U. S. Department of Labor reports net declines of 0.12 per cent in the wholesale price of all commodities, of 2.09 per cent in farm products, and of 0.92 per cent in foods between September 14 and October 19. Prices for dairy, poultry and cereal products are on the upward move while meats, fruits, and vegetables are lower. Net rise in food prices for the year is 14.6 per cent. For the five weeks ending October 26 the New York *Journal of Commerce* index of general prices is up only 0.37 per cent. That of grain prices dropped 3.02 per cent, while the food price index fell 1.42 per cent.

Oct. 1, the total supply was 376,300,000 lb., lower by almost 50 million pounds than on Sept. 1, and 60 per cent below Jan. 1, 1935. This figure is the lowest since records have been kept, and compares to a five-year average of 639,997,000 lb.

The present supply of stored meats is made up of 277,771,000 lb. of pork; 48,145,000 lb. of beef; 1,377,000 lb. of lamb; and 49,067,000 lb. of miscellaneous meats. Lard in storage is 45,188,000 lb., off 8,349,000 lb. from Sept. 1.

Present supplies and future prospects have resulted in a much lower than normal amount of meat being placed in storage for the month.

Wheat Consumption Higher in England

PER CAPITA consumption of wheat in the United States is tentatively estimated for 1935 at 160 lb. by Alonzo E. Taylor of the Food Research Institute. This compares with the 225 lb. per capita consumption of wheat in England as stated by Herman Steen before the Millers National Federation. Mr. Steen attributes the higher consumption to the fact that English bread has a better flavor.

INDICATORS

RED pitted cherry production this year at 2,562,683 cases, compares to 1,855,045 cases in 1934.

CONFECTIONERY and competitive chocolate products sales in September totaled $24,191,700, compared to $21,181,764 a year ago, continuing the upward trend in this industry.

APPLE PRODUCTION is forecast by the U. S. Department of Agriculture at 168,209,000 bu., a 33⅓ per cent increase over 1934.

DRIED FRUIT crops in California were damaged somewhat by heavy rains in August and September.

CARLOADINGS showed an upward tendency during most of the past month, in most foods except livestock which was off considerably from 1934 figures.

Construction News

	Pending (thousands)	Awarded October (thousands)	Total Awarded 1935 (thousands)
Bakery	$666	$197	$623
Beverages	228	698	4,552
Canning and Preserving	140	28	896
Confectionery	....	.....	28
Grain Mill Products	56	.....	1,354
Ice Manufactured	....	.....	459
Meats and Meat Products	238	115	2,205
Milk Products	263	227	1,802
Miscellaneous	314	298	3,517
Total	$1,905	$1,563	$15,436

MALT is likely to cost brewers more in the ensuing year, as unfavorable weather conditions have rendered this year's American barley crop largely unfit for malting.

FARMS are bringing higher prices in recent months, as indicated by sales of Federal Land Banks, which report an upward tendency paralleling increases in farm income.

FOOD prices paid by restaurants and hotels are now about 8½ per cent above levels current this time last year, largely because of increases in the cost of meat, poultry and seafood.

EXPORTS of canned foods in 1935 have reversed the upward trend apparent during the first six months of the year, and are now slightly below 1934.

CANNED SALMON competition from Japan may be reduced this year, as the Japanese catch has fallen off around 40 per cent.

CANNED SALMON production in British Columbia this year, at 939,122 cases, was the best since 1931, in contrast to the lower pack realized in American territory.

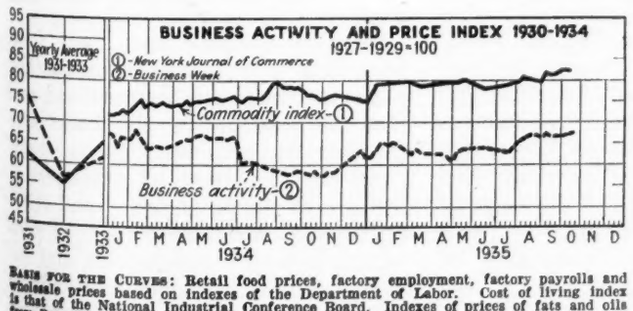
SARDINE PACK in Maine, almost completed for the year, has already reached 2,000,000 cases.

PEA PACK totals, announced by National Canners Association, were equivalent to 24,614,120 standard cases, slightly higher than the estimate of last month.

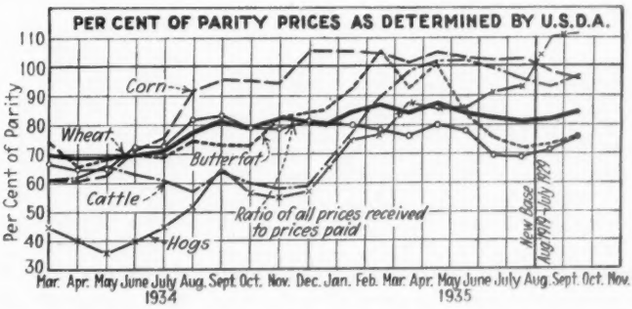
CORN PACK for 1935, estimated to equal 21,000,000 cases of No. 2's, is the second highest on record, but the fancy grade is relatively scarce.

TOMATO YIELD for canning has been re-estimated on Oct. 1, at 1,768,740 tons, compared to 1,405,600 tons last year, and a five-year average of 1,309,800 tons.

BEET YIELD for canning was estimated on Oct. 1 at 51,980, compared to 40,200 tons in 1934, and an average of 33,700 tons for the preceding five years.



BASIS FOR THE CURVES: Retail food prices, factory employment, factory payrolls and wholesale prices based on indexes of the Department of Labor. Cost of living index is that of the National Industrial Conference Board. Indexes of prices of fats and oils from Bureau of Raw Materials for American Vegetable Oils and Fats Industries; and of all farm prices are from the U. S. Department of Agriculture, as are the per cent of parity prices.


PER CENT OF PARITY PRICES AS DETERMINED BY U.S.D.A.
Per Cent of Parity
Corn
Wheat
Butterfat
Cattle
Hogs
Ratio of all prices received to prices paid
New Base Aug 1909-July 1929
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov.
1934
1935

Books Received

YEARBOOK OF AGRICULTURE 1934. Published by U. S. Department of Agriculture, Washington, D. C. 762 pp., 6¼x9¼ in.; cloth; illustrated. Price, $1.

Long recognized as a valuable and handy reference book on statistics this yearly report of the Secretary of Agriculture to the President has rapidly become of increasing value as a one-volume encyclopedia on subjects and policies pertaining to agriculture. "Toward a Balanced Abundance" is the Secretary's theme for the section devoted to the past year in agriculture.

THE USE OF SODIUM SULPHITE AS AN ADDITION TO ALKALINE DETERGENTS FOR TINNED WARE. By R. Kerr, Liverpool, England. Published by International Tin Research and Development Council, 378 Strand, London, W.C. 2. 1935. 14 pp.; 6¼x9¼ in.; illustrated. Free. Obtainable from American office, 149 Broadway, New York, N. Y.

Use of alkaline detergents for removal of milk films from dairy equipment and fat or oily films from other tinned surfaces used in food processing has the objection that the tin is attacked and that finally the surfaces have to be retinned or the equipment junked.

Virtue of 1 part NA_2SO_3 to 10 parts crystallized NA_2CO_3 or 1 part NA_2SO_3 to 4 parts NAOH or soda ash appears to be the removal of dissolved oxygen from the solution. This booklet is identified as Technical Publication No. 19 Series A of the Council. It is in fact a reprint of an article appearing on pp. 217-221 T., Vol. 54 (1935) *Jr. Soc. Chem. Ind.*

AIDS TO THE ANALYSIS OF FOOD AND DRUGS. Fifth Edition. By C. G. Moor and William Partridge, Public Analysts for Dorset County, England. Published by William Wood & Co., Baltimore, Md. 1934. 322 pp.; 4¼x6½ in.; cloth. Price $1.50.

Food workers desirous of checking American data and procedure with that of Engand will find value in this handy book.

Its usefulness in England is indicated by the four revisions it has had since 1895. The present revision is largely the work of John Ralph Nicholls, Chemist at the Government Laboratory, London. Special attention has been directed to metallic contamination of foods and drugs and an appendix has been devoted to Acts of Parliament dealing with foods.

STRUCTURE AND COMPOSITION OF FOODS. VOL. II. VEGETABLES, LEGUMES, FRUITS. By Andrew L. Winton and Kate Barber Winton. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York, N. Y. 1935. 904 pp.; 6¼x9¼ in.; illustrated. Price $15.

As former state and federal chemist and microscopist the authors have a rich background and experience upon which to draw for the preparation of a book of this character. However, they have supplemented their knowledge with that of nearly a score of other chemists and microscopists throughout the world.

As in Vol. I, reviewed in FOOD INDUSTRIES, September, 1932, page 315, emphasis is placed on the macroscopic and microscopic structure of the foods—vegetables, legumes and fruits in this case—as well as their chemical composition.

Custard Pastries

(Continued from page 534)

rooms of the bakery to the retailer's shop. Refrigeration of the truck compartment, if the distributor's route is of any considerable length, as well as of the display cases in the retail shop, is of real importance. Finally, handling of the pastry product with simple, easily cleanable, and always clean tongs, fork, knife or other similar device minimizes the hazard at this point.

In a discussion of this nature, brief consideration should be given also to the ultimate sources of the bacteria that are more frequently involved in outbreaks of "food-poisoning."

Man, himself, even though in the best of health, may be regarded as responsible for providing most of the organisms causing "food-poisoning." Most of the types of organisms causing "food-poisoning" are harbored in the intestinal tract or in the urinary tract of the so-called "healthy carrier" and are shed by him in the intestinal or urinary discharges. Too frequently, especially in the person not too meticulously clean in his personal hygiene and habits, the transfer of these discharges by fingers is neither difficult of accomplishment nor remote of possibility. Such transfer does occur. In many instances, it is the only positive possibility that can be found after thorough and intelligent epidemiologic study. The intermittency of this "carrier state" complicates the detection of the carrier so that unless the bacteriologic study of the employees, under carefully controlled conditions, is repeated at relatively frequent intervals even medical - bacteriologic - epidemiologic search for the carrier may be fruitless. The routine examination of food-handlers too frequently deteriorates into a medical inspection and a venereal disease search, and the all-important stool and urine bacteriologic examination omitted.

The other important source of bacteria which may be responsible for "cream-custard poisoning" is found in the various members of the lower animal kingdom, more particularly rodents. In several instances the responsible organism has been obtained from rodent fecal matter on shelves in the bakery. Hence, when the partially-cooked custard is allowed to cool and "mature" on a shelf for several hours or overnight at room temperature, without suitable cover or other protection, the stage is set for the custard to be contaminated by fecal droppings from the rodents about the premises. An added hazard which should receive more attention than has been given it, is found in the so-called "virus type" of rodent "poison." This type of "rat poison" is made of a living bacterial culture which is thought by some to be harmless to the human. It has been found, however, that such cultures are not harmless and that they have been responsible for "food-poisoning."

During recent years, considerable attention has been given to another type of organism apparently very definitely related to the problem of "food poisoning." The bacteria heretofore discussed have been inhabitants of the intestinal tract of man and rodents, the organism referred to at this time, however, is found widely distributed in nature, and especially on the skin of man. Not all strains of the staphylococcus are capable of forming the gastrointestinal irritant that is probably the responsible factor in this type of "food-poisoning," but the heavy pigment and enterotoxin-producing strains of staphylococci (small, round bacteria growing in grape-like bunches) have been found to be involved not infrequently. The staphylococcus is found in most abscesses and "boils" and is nearly always present on the skin of the human. For these, if not for the aesthetic, reasons, it is important to eliminate hand-handling of the custard and of cream-custard pastry.

We may conclude, then, that "food poisoning" traceable to cream-custard pastry products can be prevented and that the products can be made safe through the continued use of relatively simple methods of cleanliness in the proper manufacturing and merchandising surroundings, and of protection against contamination and incubation of the product; particularly through sterilization of equipment and thorough adequate refrigeration.

Keeping Up With The Field

- *FTC receives $75,000 for food investigation*
- *Bakers analyze problems in terms of tomorrow*
- *Packers discuss outlook in the meat industry*
- *Ice cream men put pressure on merchandising*
- *Brewers get sound advice on current problems*

Investigation Begins

FUNDS to the extent of $75,000 have been found by the Federal Trade Commission with which to launch its investigation into the food field. And already a questionnaire has been mailed to manufacturers and processors of primary agricultural products, including cattle, hogs, wheat, milk, eggs, potatoes, cotton and tobacco. The questionnaire calls for information on purchases of the primary commodities, sales of products made from them, together with comprehensive balance sheets and income statements for recent years in order to ascertain investments, profits and rates of return on investments.

Bakers Look at Tomorrow

ON the theme of "tomorrow" the American Bakers' Association last month held its 39th convention at Chicago. Recognizing that the future will hold problems weightier than the baking industry ever had to cope with before, the entire program was directed toward a detailed analysis of the trends and implications of the future, as well as a consideration of the possible ways to meet them.

The long continued decline in per capita consumption of bakery products was recognized as the outstanding obstacle to be overcome not only by bakers but by flour millers and allied industries. Per capita consumption of wheat in the United States now stands at about 160 lb. with the possibility of a further decline to 140 lb. in the next ten or twenty years if the trend is not checked.

To ascertain the industry's views as to the cause of the continued decline in consumption, a referendum was conducted at one of the general meetings. Out of 349 votes, 195 expressed belief that the greater variety of foods now available was the principal cause; 64 believed that it was caused by something controllable by the bakers themselves; 56 believed it was caused by less total food consumption; and 34 believed it was caused by the influence of diet discussions.

On other referendum questions there were developed some very interesting cross-sections of opinion. Asked to express an opinion on the cause of the different taste of bread compared to 30 years ago, 348 members of the industry gave as their first choice: changes in formulas, 142; changes in technique, 82; wrapping bread, 63; and changes in type of ingredients, 61. Out of 344 voting, 178 agreed that the greatest contributor to costs after the loaf is baked was the increased service: cooling, slicing, wrapping, and additional daily deliveries.

HENRY STUDE
Pilots bakers through convention

On the question of the proper dealer's margin on 1-lb. loaves, 120 out of 330 thought 1 cent was the correct figure; but 89 voted for 1½ cents, 77 voted for 2 cents and 44 thought it was up to the dealer to decide for himself.

Carl P. Schmidt, president of Schmidt Baking Co., Baltimore, pleaded for a better understanding of the place of the production man in a baking business, stating that in the future he cannot continue to give way to all the whims of management and sales departments if bread consumption is to be kept up. He believed that in the future the production man should demand a factual analysis of sales possibilities and consumer preference of new items before making any moves toward producing them on a quantity basis.

Failure to tickle the palates of the consumer was blamed by L. E. Carter, president, Keig-Stevens Baking Co., Rockford, Ill., as the cause of the decline in bread consumption. His diagnosis was that "oven-fresh" bread is the answer. Also, he recommended clinics to find out what pleases the consumer most.

L. V. Burton, editor of FOOD INDUSTRIES, called attention to the highly perishable flavor of fresh bread and said that the baking industry had done very little to conserve the flavor, citing the other food industries dealing in perishable foods as having already solved similar problems of perishability. Speaking of the difficulty in ascertaining what the consumer really wanted in bread, he pointed out that no consumer can specify in terms of a manufactured product what it is that he wants—all that the consumer can do is to express likes and dislikes to products that are offered to him.

Packaging Council Named

SEVENTY-FIVE leaders in the packaging, packing and shipping field have been appointed to a packaging conference and exposition council. Selected by American Management Association, sponsor of the Sixth Packaging Exposition to be held in New York, March 3-6, these people will assist in developing definite plans for the conferences and clinics to be held in conjunction with the exposition. They will devise a program covering all phases of packaging.

Treaty Favors Foods

EXPORTS of foods to Colombia are expected to be stimulated by tariff concessions granted the United States in the reciprocal trade agreement recently concluded between the two countries. The commodities affected include lard, previous to 1929 the most important agricultural product exported to the South American country. The proposed reduction amounts to 50 per cent, the pro-

posed duty being approximately 30 per cent ad valorem. Reductions of 20 to 70 per cent also are provided for fresh, canned and dried fruits; canned vegetables; many kinds of salted, smoked and canned meats; including hams and sausages; fish and canned fish; and condensed and other prepared milks. Concessions to Colombia include assurance of no duty on coffee and bananas, two of the most important exports to the United States.

Pig Program Goes On

DESPITE opposition registered by packers, distributors and consumers at a recent hearing, the corn-hog control program continues. This decision was reached by the AAA after a referendum among farmers showed the agrarians to be strongly in favor of the program. The government wants the control to continue so that a shift in production from normal areas can be prevented and so that over-production in 1937 can be avoided.

Packers Get Together

MORE than 1,200 packers' representatives from all sections of the country attended the annual convention of Institute of American Meat Packers in Chicago, Oct. 18-22.

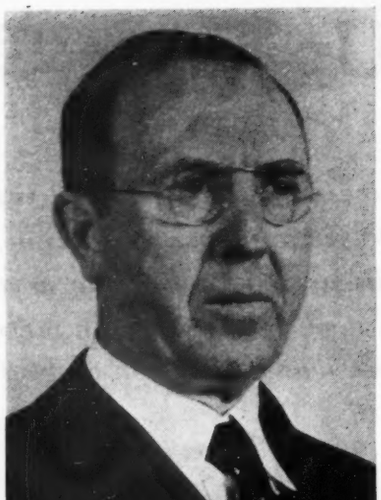
The keynote of the convention was struck by Frank A. Hunter, head of the Hunter Packing Co., of East St. Louis, and chairman of the Institute, when he said that virtually all of this year's profit represents enhancement of inventory values, rather than operations, and the outlook for next year is clouded by prospective further increase in taxes. "We can only shiver in contemplation of what is to come," he said, referring to governmental deficits and the new social security legislation. Mr. Hunter made a proposal to narrow the fluctuations in the price of livestock, declaring this should be limited to 5 to 10 cents instead of the present 40 to 50 cents.

A. C. Sinclair, vice-president of Kingan & Co., summed up the sales problem in three main points: 1. Reduce selling costs. 2. Select the right men for salesmen, educate them, train them, so they will be salesmen, not order takers. 3. Lay plans for the future meat consumption by adopting a program to educate the consumer to appreciate the value of meat in the daily diet.

A. O. Luer, president of Luer Packing Co., pictured business conditions on the Pacific coast as "far better" than last year.

C. A. Burmeister, senior economist of the Bureau of Agricultural Economics, sees great improvement in the quality of the livestock and meat supply in 1936.

R. H. Cabell, president of Armour & Co., in biting language demanded a "show-down" on the subject of taxes and their effect in raising the prices of things the public buys. He attacked the practice of forcing business of every description to serve in the role of tax collector without that fact being apparent to the people from whom in large part the taxes are being collected.



FRANK A. HUNTER
Continues as chairman of IAMP.

G. F. Swift, chairman of Swift & Co., and Thomas E. Wilson, chairman of Wilson & Co., praised the "outstandingly efficient service" packers are giving consumers, and cited the small profit per pound of meat handled. They pleaded for a better understanding on the part of the public of the packing industry and its problems.

Directors and officers of the Institute were re-elected. George A. Schmidt, president of Stahl-Meyer, Inc., New York City, was re-elected chairman of the governing committee of the National Organization of Sausage Manufacturers division.

Conventions

NOVEMBER

4-5—New England Bakers' Association, fall meeting, Biltmore Hotel, Providence, R. I. Robert Sullivan, 177 Milk St., Boston, Mass., secretary.

6-8—Association of Pacific Fisheries, Del Monte, Calif.

12-15—Southern Association of Ice Cream Manufacturers, Miami, Fla.

13-15—Associated Grocery Manufacturers of America, Waldorf-Astoria Hotel, New York. Paul S. Willis, 205 E. 42d St., New York, president.

18-22—American Bottlers of Carbonated Beverages, convention and exposition, Fifth Regiment Armory, Baltimore, James Vernor, Jr., 726 Bond Bldg., Washington, D. C., chairman of convention and exposition committee.

DECEMBER

2-7—Fifteenth Exposition of Chemical Industries, Grand Central Palace, New York.

Brewers Get Advice

ATTACKS by brewers using bottles against those using cans, or vice versa, could lead only to public revulsion, would be bad advertising and would soon make thousands of people feel that both were bad. That is what 500 brewers were told by C. B. Larrabee, *Printers' Ink*, speaking at the Los Angeles convention of U. S. Brewers' Association last month.

Colonel Jacob Ruppert, who was re-elected president of the Association, congratulated the brewers for maintaining the principles of their NRA code and voiced approval of resolutions to divorce beer from hard liquors in the public mind. He also urged the brewers to seek the highest class and most ethical retail outlets, and urged them to keep out of the tavern business themselves. Referring to consumption, Colonel Ruppert estimated that 47,000,000 bbl. of beer would be drunk during 1935, and he expressed the belief that consumption would jump to 100,000,000 bbl. annually if taxes were regulated to permit the 5-cent glass to be sold at a profit.

Dr. George Parrish, Los Angeles health officer, suggested that the brewers start a campaign to convince the public that beer is valuable as a food.

More Packer Troubles

IF IT isn't one set of charges its another in the life of the meat packer. For several months twelve Southern packers have been defending themselves against government charges of price fixing, the final hearing in this case coming to a close last month. And now National-American Wholesale Grocers' Association accuses certain packers of violating the Packers' Consent Decree by selling mayonnaise, tomato juice and sauerkraut, the charges being made to the Department of Justice. At the same time the NAWGA objected in advance to modification of the Decree to permit the use of packers' refrigerator cars for the transportation of sea food products from the Atlantic Coast to Western states.

Adopts NRA Standard

TO BRING federal procedure into line with trade practices as conducted under an NRA code, the Food and Drug Administration has announced a new ruling in regard to the labeling of substandard jams and preserves. The ruling pertains to mixtures of fruit and sugar made from less than 45 but more than 25 lb. of fruit to each 55 lb. of sugar. Such mixtures should be labeled with the word "Imitation" and with a clear statement indicating wherein they are imitations.

Making Cream Pastry Safe

WHILE the approach of colder weather tends to lessen the danger of "food poisoning" due to custard pastries, public health officials in the various states are not closing their eyes to the likelihood of a recurrence of outbreaks both small and relatively large such as occurred in Westchester County, New York, last spring.

The Department of Health of New Jersey adopted the following regulations, effective Nov. 1:

1. All commercially prepared custard and cream-filled bakery products shall be made under clean conditions.
2. Only pasteurized milk or cream shall be used.
3. The temperature and time of heating the mix shall be as a minimum the equivalent of a temperature of 142 deg. F. for a period of not less than 30 minutes.
4. Upon completion of the cooking of the mix, it shall be immediately transferred into previously sterilized containers, properly covered, and chilled without delay to 50 deg. F. or below and maintained at such temperature until used.
5. The filling apparatus shall be of suitable impervious material and shall be cleaned and properly sterilized before each use. No cloth filling bags shall be used.
6. The hands of employees engaged in the preparation of custard and cream-filled bakery products shall not touch the custards or cream fillings.
7. No pastries containing custard or cream fillings shall be displayed in windows or showcases, except those that are chilled to 50 deg. F. or below.
8. Pastries containing custard or cream filling shall not be sold or delivered from vehicles, except such vehicles be equipped with a refrigerated compartment maintained at a temperature of 50 deg. F. or below; provided, however, that such pastries may be delivered from manufacturers to retail dealers or consumers by special trip without continuous refrigeration when it is possible to complete such delivery within two hours elapsed time.

Department of Health officials of Westchester County, New York, are formulating regulations for the manufacturing and handling of cream-filled pastries.

Dairy Industries Meet

THREE groups in the dairy industry convened in St. Louis last month to exchange ideas on their business problems and to point the way for future activities. Fifteen hundred members attended the meeting of International Association of Ice Cream Manufacturers, 650 registered for the convention of International Association of Milk Dealers and 250 were present for the confab of National Association of Retail Ice Cream Manufacturers.

Merchandising was the headliner at the meeting of the international ice cream group. A resolution passed in the final session approved the organizing of Merchandising Ice Cream Institute, permitting membership in the institute without additional fees from the manufacturers who are members of the association.

"The Pickup That Never Lets You Down," is the new slogan which in 1936 will extend the theme of the "3 O'clock Ice Cream Recess," of 1935. This slogan is reinforced throughout the copy schedule with others which challenge claims of foods and beverages alike, in: "A Scoop of Fresh Ambition"; "Here's What It Takes to Finish the Day Strong"; "Fagged at Five; Try the Malted Milk Cure"; and "Make the 3 O'clock Recess Your Habit for Success."

With "Merchandising Your Advertising" as a topic, G. G. Diffenback, advertising manager for Abbotts Dairies, Inc., Philadelphia, recommended the methods of national advertisers to manufacturers of ice cream and its ingredients. Demonstrations inside stores have in some cases increased sales 80 per cent, said Mr. Diffenback.

Paul Reinhold, president of Foremost Dairies, Jacksonville, Fla., took a lesson from the beer people who have put their product in a high glass. It should be offered in beautiful tulip cups in which it stands high, he said.

O'Neal M. Johnson, Washington, D. C., spoke on "Trends of the Retail Ice Cream Store." There are some advantages through better merchandising and greater gallonage concentrated in a store, with less cost for distribution, but the retail stores are not a panacea, according to Mr. Johnson.

Prof. M. J. Prucha, University of Illinois, said that he and his associates were working on a method of treating nuts to make them more nearly sterile. "There is the feeling," he declared, "that the high-class manufacturers should do something about nuts in connection with sanitation."

W. H. Martin, Kansas State College, pointed out that it would be economical to increase the protein solids in ice cream without increasing the fats if a product agreeable to the consumer can be maintained in the process.

W. R. Cammack, president of Crescent Creamery Co., St. Paul, was elected president of the association. The National Association of Retail Ice Cream Manufacturers elected I. C. Reynolds, Toledo, president.

W. R. CAMMACK
Elected president of ice cream group.

What About Loans?

OF APPROXIMATELY $580,000,000 authorized to bolster credit for industry only about $155,000,000 of loans have been approved one year after RFC and Federal Reserve Banks have been empowered to make direct loans. This is according to a study, "What about direct loans to industry?" released by a committee representing the 130 member publications of Associated Business Papers, Inc., and the National Conference of Business Paper Editors. Railroads, insurance companies, banks and farmers have realized far greater benefits through federal financing than has private business, the study concludes.

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Concentrates

▶ RYE PRODUCTION will be curtailed during 1936-39 by AAA benefit payments for adjusting acreage to 75 per cent of average. . . . After Nov. 25, live-poultry dealers and handlers in New York and Jersey City must have licenses from the Secretary of Agriculture. . . . Wineries in New York State are permitted to blend their product and do not have to ferment on their premises under a recent ruling.

▶THERE WILL BE a wholesale closing of bakeries in Ohio unless the price of bread is increased within a month, according to Ohio Bakers' Association. . . . The AAA contemplates spending $5,000,000 to raise the price of potatoes. . . . Pasteurized certified milk was placed on the market in New York on Oct. 15.

▶FLORIDA CITRUS commission has adopted a federal proposal to establish a third grade of citrus fruit in Florida and Texas. . . . Wage increases of 4 to 12 per cent have been granted 2,000 workers in 38 dairy and ice cream companies in Cleveland. . . . American Association of Cereal Chemists will hold its 1936 annual meeting in Dallas on the tentative dates, June 1-5. . . . The salmon canning industry of British Columbia has been greatly over-expanded, according to a report by the B. C. deputy commissioner of fisheries.

▶FEDERAL HOUSING Administration has issued a booklet describing the nature of the loans which it makes for modernizing buildings, including industrial plants. . . . "Spray Residue Removal from Apples and Other Fruits" is the subject of Farmers Bulletin 1752-F published by the Department of Agriculture.

Men . . . Jobs . . . and Companies

Industry

• ARMOUR & Co., Chicago, has leased a new slaughtering plant at Green Bay, Wis., and has opened a new shortening and salad oil refinery at Chattanooga.

• BLUE BONNET CHEESE Co. has moved from Fayetteville, Tenn., to Montgomery, Ala., the new plant having a capacity of 400 lb. daily.

• CLARK DAIRY PRODUCTS, INC., recently opened a new cheese factory at Lebanon, Tenn. W. Riley Clark is president.

• CLINE & JOHNSON, INC., has moved from Port Huron, to Owosso, Mich., taking over part of the plant of Walker Candy Co.

• GUYAN CREAMERY Co., Guyandotte, W. Va., has consolidated with Huntington (W. Va.) Creamery Co. to do business under the former's name. The latter company's plant will be closed.

• HERSHEY CHOCOLATE CORP., Hershey, Pa., is completing a large three-story office building which has no windows. Accurately controlled temperature and humidity and modern lighting will make the office independent of outside weather conditions.

• KEWASKUM (WIS.) CREAMERY Co. has purchased Tomah (Wis.) Milk Co.

R. S. TATE

Named assistant to F. B. Childs, vice-president of Libby, McNeill & Libby, Chicago, a few months ago, he now takes charge of Libby's recently formed canned milk department.

and will continue the manufacture of cottage cheese.

• LID-WID PRODUCTS Co. has opened a plant at Long Beach, Calif., to extract raw vegetable and fruit juices. Parsley, spinach, radish, cucumber, celery, orange, lemon and grape juices are marketed in bottles.

• LOFT, INC., Long Island City, N. Y., is suing Corn Industries Research Foundation, Inc., to recover alleged damages of $4,250,000 growing out of the alleged existence of a glucose monopoly.

• LONG ISLAND DUCK PACKING CORP. has been organized and will construct a duck packing and quick-freezing plant at Westhampton, N. Y. The plant will use the "Z" process, which freezes the ducks in from one to two hours, and it will handle 5,000 ducks daily.

•LOOSE-WILES BISCUIT Co. plans to build a factory and storage building at Dayton, Ohio.

• JOHN MORRELL & Co., Ottumwa, Iowa, has introduced a new line of shortening under the trade name, "Pride."

• MAX P. RADLOFF CHEESE Co., Hustisford, Wis., has opened a branch factory at Minerva, Ohio.

• RALSTON-PURINA Co. is erecting a $100,000 addition to its plant at Lafayette, Ind.

• SCHLUDERBERG-KURDLE Co., Baltimore, plans a new $75,000 packing plant.

• SHEFFIELD FARMS Co. intends to motorize its milk delivery service in a large part of the borough of Manhattan, New York, and it also contemplates building one of the largest milk depots in the world.

• SPRECKLES SUGAR CORP., Yonkers, N. Y., and its subsidiary, Syrup Products Co., Inc., are expected to be in operation again soon, as bids submitted in the receivership sale have been accepted. A syndicate headed by A. M. Kahn of Chicago bid $220,000 in cash for the sugar corporation. Representatives of Mills Novelty Co., Chicago, bid $115,000 in cash for the syrup subsidiary.

• STANDARD BRANDS, INC., New York, has taken to federal court its charges of patent infringment against National Grain Yeast Corp., Belleville, N. J. Three patents covering the manufacture of compressed yeast are involved. Standard Brands asks damages and an injunction.

• TOBIN PACKING CORP. is erecting at Fort Dodge, Ia., a $50,000 plant addition.

• UNITED DAIRY Co., Barnesville, Ohio, will erect a $100,000 plant at Beverly, Ohio. The company produces condensed and powdered milk.

• WILSON & Co., Chicago, is building a $200,000, four-story building to be used by Wilson Laboratories, a division. This is part of an expansion program under way by Wilson.

• WAUKESHA (WIS.) DAIRY Co. has been purchased by F. E. Fox, owner of Fox Guernsey Dairy.

Personnel

• C. L. ASHLEY has been selected to manage Wilson Provision Co., Peoria, Ill., recently purchased by Armour & Co.

• DONALD S. BURNS now is head buyer for Swift & Co. at the St. Paul plant.

• A. L. CAPPS recently was made general manager of Armour & Co.'s Spokane plant, with E. M. Luke as assistant.

• J. W. CARKNER, vice-president in charge of sales for Loft, Inc., Long Island City, N. Y., succeeds Charles C. Guth, Sr., as president of the company.

• C. S. CHURCHILL, H. H. McKee and R. C. Sims have been made assistant general superintendents of Wilson & Co., Chicago.

• JAY GOULD, who recently resigned the presidency of Best Foods, Inc., New York, has become a vice-president of Frankfort Distilleries, Inc., Louisville, of which James F. Brownlee, another former food executive, is president.

• WM. R. GREEN, chief chemist of Continental Baking Co., has been chosen chairman of the Kansas City section of American Association of Cereal Chemists.

• GODFREY ELSASSER, Covington, Ky., heads Kentucky Master Bakers' Assn. for the coming year. John Evans, Ashland, is vice-president.

• GEORGE GEISSLER, treasurer of Associated Bakers of America since its organization in 1918, resigned recently because of retirement from business.

WILLIAM H. SIMMONS

He has been made president and general manager of J. Renner Brewing Co., Akron, Ohio. Ernest C. Deibel, head of the brewery for 18 years, becomes chairman of the board.

• CURRY C. HALL, Portsmouth, has been elected president of Virginia State Bakers' Association.

• E. F. JUDD succeeds the late Mayor C. L. Barton as manager of Camden (Ark.) Coca-Cola Bottling Co.

• LINCOLN M. LAMPERT, for more than six years chief chemist in the research laboratory of Golden State Co., Ltd., at San Francisco, has resigned to become senior chemist in the California State Dairy Service Laboratory.

• J. C. LETTICE has become manager of the Winter Park packing house of Tree-Gold Corp., having resigned as manager and treasurer of the Florida citrus-control committee to accept the position.

• PERRY I. MCHENRY, Viroqua, has been elected president of Wisconsin Buttermakers' Association.

• C. H. OVERLY has been named manager of Armour & Co.'s new slaughtering plant at Green Bay, Wis. R. W. Porter and E. F. O'Keef are his assistants.

• H. W. QUADE now is general superintendent of Kewaskum Creamery Co.'s plant at Tomah, Wis.

• W. H. RITTER, JR., became sales manager of P. J. Ritter Co., Bridgeton, N. J., Nov. 1. He succeeds J. S. Weltmer, who is joining W. N. Clark Co., Rochester, N. Y.

• F. M. ROSE has returned to Chicago to take charge of candy production for Kraft-Phenix Cheese Corp. He has been at the Jersey City, N. J., plant of the company.

• ARTHUR C. SCHIER has become assistant general traffic manager for General Foods Corp., New York, having quit as director of Water Routes, Inc., to accept the position.

• JOHN SHORT, production manager of Busy Bee Candy Co., St. Louis, has acquired controlling interest in his company.

• ROBERT T. SMITH has moved up from vice-president to president of Association of Ice Cream Manufacturers of Pennsylvania and New Jersey. He is with Smith & Clark, Scranton, Pa.

• B. E. SNYDER, of R. B. Davis Co., Hoboken, N. J., is the new treasurer of Associated Grocery Manufacturers of America. He succeeds H. D. Crippen, who resigned because of illness.

• DR. L. M. TOLMAN has been placed in charge of the new bakery research department of Wilson & Co., Chicago.

Deaths

• JAMES H. BAER, 79, head of Durham (N. C.) Ice Cream Co. and for 57 years in the ice cream industry, Oct. 14.

• SILAS C. BALDWIN, SR., 86, who at one time owned a number of dairies in New Jersey and who helped to found Dairyman's Can Manufacturing Co., Sept. 22.

• JAMES E. FREEL, 66, retired candy manufacturer who founded the old Brooklyn (N. Y.) Candy Co., Oct. 15.

• BRUCE G. GILCHREST, 75, a founder of Gorton-Pew Fisheries Co., and for more than 30 years New York manager of the company, Oct. 24.

• HARRY GORDON, 77, founder of Gordon Creamery Co., Detroit, Oct. 8.

• DR. SAMUEL C. HOOKER, 71, formerly a director and one of the chief technicians of American Sugar Refining Co., New York, Oct. 12.

• RAYMOND J. KATHMAN, 42, manager of the Evansville (Ind.) branch of Standard Brands, Inc., recently.

• JOHN KIRKPATRICK, SR., dean of Wisconsin cheese men and founder of the wholesale cheese company bearing his name, at Richland Center, Wis., Sept. 30.

• THOMAS J. KURDLE, 80, founder of T. J. Kurdle Co., Baltimore, which combined with William Schluderberg & Son Co. in 1920, Oct. 2.

• H. BARTON PARRY, 46, until last November secretary of Hecker H-O Co., Inc., Buffalo, Sept. 24.

• CHARLES H. POTTER, 84, founder of Farmers' Cooperative Marketing Co., now known as Pure Milk Association, at Chicago, Oct. 10.

• JULIUS C. RISETTO, 84, for 64 years a date and fig expert with Hills Bros. Co., New York, Sept. 28.

• CYRUS W. SICKLEY, 77, former owner of a chain of bakeries in Yonkers, N. Y., Oct. 6.

• JAMES O. SCOTT, 75, president of Richmond (Va.) Dairy Co. and Southern Cream & Milk Co., recently.

• MAURICE A. TAYLOR, 81, retired owner of a baking business in Rye, N. Y., Oct. 6.

• JOSEPH WIEDENMAYER, 57, a director of United States Dairy Products Co., Philadelphia, Oct. 12, by suicide, at Newark, N. J.

• THOMAS FRANCIS YORE, 69, president of Yore Bros. Dairy, Chicago, which he founded 47 years ago, at Chicago, Sept. 22.

Associated Industries

• AMERICAN CAN CO., New York, announces the return to its employ of A. A. Morse with the title of executive representative. Mr. Morse, who had been secretary of the board of governors of the can manufacturers' industry under NRA, was with the company during its formation in 1901.

• FOUR-WHEEL-DRIVE AUTO CO., Clintonville, Wis., has inaugurated a threefold safety program to prevent carbon monoxide from collecting in the cabs of trucks. Tight exhaust lines, proper ignition and carburetion and gas-tight cabs are steps in the program.

• ELGIN SOFTENER CORP. has appointed Kent-Ervin Engineering Co., Milwaukee, agents to handle boiler water conditioning and control equipment.

• LINK-BELT CO. has appointed T. Frank Webster manager at Boston.

• MASON-NEILAN REGULATOR CO., Boston, has inaugurated a new field demonstration service, using a truck equipped with reducing valves and control instruments in a nation-wide tour.

• OWENS-ILLINOIS GLASS CO., Toledo, has appointed Smith L. Rairdon Eastern sales manager.

PATENTS

Means and Methods for Coloring Flour—Elizabeth J. Bostrom and Austin E. Summers, Spokane, Wash. No. 2,012,708. Aug. 27, 1935.

Shredded Cereal Product in Biscuit Form With a Dome Top and Numerous Filaments Lying Parallel to Each Other and Extending Diagonally Across One Surface of the Biscuit—Kenneth D. Loose, Bronxville, N. Y., to Loose-Wiles Biscuit Co., Long Island City, N. Y. No. 2,013,003. Sept. 3, 1935.

Means and Methods for Incorporating Gas Under Pressure in a Liquid or Semi-Liquid Food While in Agitation at Freezing Temperatures—Clarence W. Vogt, to Vogt Processes, Inc., Louisville, Ky. Nos. 2,013,016; 2,013,017, and 2,013,018. Sept. 3, 1935.

Barrels for Beer Made From Copper and Silicon Alloy; From Copper, Silicon and Tin Alloy; and From Copper, Silicon and Iron Alloy—Richard A. Wilkins to Revere Copper & Brass, Inc., Rome, N. Y. Nos. 2,013,325; 2,013,326, and 2,013,327. Sept. 3, 1935.

Foods Contained in Sealed Container Protected From Objectionable Flavors by Use of Small Content of a Hydroxy Aryl Compound in Cement Forming Seal on Container—Ernest E. Mollin to Standard Oil Co., Chicago, Ill. No. 2,013,343. Sept. 3, 1935.

Lauter or Mash Tub With a Rotatable Double Arm Agitator and a Rotatable Double Arm Scraper Which Can be Raised or Lowered Independently of Each Other and Which Can Be Made to Rotate Together in the Same Direction to Effect an Alternating Stirring and Scraper Action—Carl L. Kenney, Pittsburg, Pa. Nos. 2,013,444; 2,013,445. Sept. 3, 1935.

Meats Smoked in an Elongated Chamber With an Endless Conveyor Into Which Smoke Is Supplied at Each End and at an Intermediate Point—James Robinson, West Bridgeford, Nottingham, England. No. 2,013,479. Sept. 3, 1935.

Air Containing 1 to 3 Per Cent Carbon Dioxide Introduced With Liquid Nutrient During Yeast Growing Period—Hans and Arnold Braasch, Neumunster, Holstein Germany to Standard Brands, Inc., New York, N. Y. No. 2,013,556

Method and Means of Making Skinless Sausages—Louis Karpiloff, Brooklyn, N. Y. No. 2,013,610. Sept. 3, 1935.

Cooked Meat Put Into Powdered Form—John C. MacLachlan to Alfred P. Hunt, Chicago, Ill. No. 2,013,859. Sept. 10, 1935.

Method for Freezing Eggs—Mary E. Pennington to The Borden Co., New York, N. Y. No. 2,013,896. Sept. 10, 1935.

Cocoa Powder Alkalized, Then Subjected to Diastatic Enzyme Action for Preparation of Sediment-free Syrup—Gurney O. Gutekunst, Rochester, N. Y.; 1/5 to Charles E. Rogers and 31/100 to Russell H. Rogers, Detroit, Mich. No. 2,014,342. Sept. 10, 1935.

Analysis

(Continued from page 540)

may vary by several hundred per cent. Its mass and reducing power were reasonably constant.

The approximate amount of caramel present in "C" was 4.65 per cent. If pure granulated sugar was used as the base of this (a permissible conclusion under a broad interpretation of the data), the treatment required 20 to 25 lb. of sugar per 100 lb. of coffee, and 4 to 5 lb. of finely ground caramel must have been added for each 100 lb. of coffee.

The above reports are self-explanatory. After they were made, it became known that a commercial laboratory in another state had previously analyzed the same coffee, finding: moisture, 3.94 per cent; fat, 13.31 per cent; ash, 4.58 per cent; cereal, none; chicory, none. This laboratory stated that the coffee contained an excessive amount of fine material which would be classed as screenings and this should show on the label as coffee and screenings.

While the analysis of this commercial laboratory gave essential correct information, it failed to answer the question put. Therein lies the reason for this article, which I hope will be helpful in the avoidance of such unsatisfactory analytical work.

In conclusion, I later learned that actually 5 per cent of a caramel-like substance was being added to the coffee "C," and that it enjoyed a marked preference with the trade in the territory where it was distributed. Personally I like my coffee to be all coffee.

Dairy Plants

(Continued from page 537)

In Milan, Italy, a large central milk plant was built by the city which is rented to a corporation of milk dealers for about ½ cent per gal. of milk handled. The milk is bought from a producers association. The company has a monopoly on the sale of milk to some 900 peddlers in the city. Wholesale and retail prices are fixed for the peddlers. The company handles around 50,000 gal. of milk daily. Most equipment was made of aluminum, some of which had been seriously pitted, probably by the use of chlorine according to the superintendent of the plant.

IN Denmark and Holland a high temperature, thin milk, high speed pasteurizer called a Stassonizer was encountered. These machines seem to work very satisfactorily. They consist of double tubes arranged concentrically with the space of 1 to 1¼ mm. between them. The milk is forced under a pressure of 4 atm. (about 57 lb. per sq.in.) through this narrow, annular space. The heating medium is contained in the center tube as well as outside of the larger tube, so that the 1 mm. film of milk is heated from both sides. Milk goes through the machine at a very high speed, about 16 sec. being required. A temperature of 73 to 75 deg. C. (164 to 167 deg. F.) is reached. Heating and cooling are accomplished in a total of 2½ min.

The machine used at the Enigheden plant in Copenhagen handled 6,000 kgm. or about 13,216 lb. or 1,537 gal. of milk per hour.

Stassonizers may be used as regenerators, heaters and coolers. Some experiments at the Danish government experimental creamery at Hillerod indicated that the bacterial efficiency was high, that the machine was economical in the use of heat, and that no cooked flavor resulted, but that the size of the cream layer was slightly reduced. The Enigheden plant in Copenhagen was owned by its employees.

TWO milk plants in Moscow and Leningrad, Russia, were on my itinerary. The Moscow plant was wonderfully equipped with fine foreign-constructed bottle washing and bottle filling machines, but no bottled milk had been sold as yet, because it seems that the Russian bottle manufacturers have had difficulty in producing a satisfactory milk bottle. A plate pasteurizer was in operation and some ice cream was also manufactured there which, however, was of poor quality and produced in a home-made freezer.

In Leningrad, a dairy plant was operating in a large former church. The manager and his assistant exhibited great pride in the manner in which the transformation of the building had been accomplished. Only a few inside changes had been necessary. A plant that my Russian guides claimed to be the largest milk plant and ice cream plant in the world was under construction in that city. Plans had been drawn by Russian engineers who had visited many of the finest plants in the United States and the latest methods of construction were being used. Tiled walls were in evidence in many rooms and much German and British equipment had already arrived. The building, a huge structure, was well advanced toward completion.